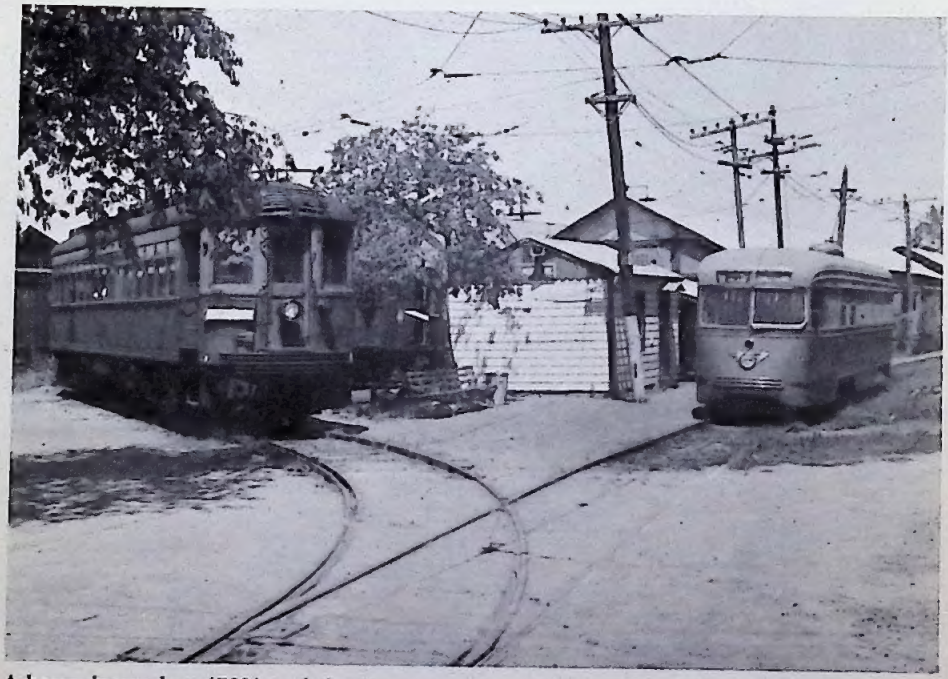
Ride Down Memory Lane

The story of the Branford Trolley Museum



A heavy interurban (709) and the first streamliner (1001) at Farm River Road station.
J. Stern

TABLE OF CONTENTS

Dedication to Frank Julian Sprague	4
The Branford Electric Railway Association	5
The Branford Collection	7
Horsecars	8
Cable Cars	11
Early Electric Cars	12
Straight-Sided Cars	17
Open Cars	18
Convertibles	22
Pay as you enter Cars	24
One-Man Operation	29
The Streamliner	33
Interurbans	34
Rapid Transit Cars	37
The Parlor Car	40
Service Cars	43
Right of Way and Location Maps	30
Roster of Equipment	48
Car Acquisition	51
Buildings and Facilities	53
Activities and Membership	56
Corporate Donors	59

"Ride Down Memory Lane" Fifth Edition Copyright 1965
By The Branford Electric Railway Association
Editing Committee: John R. Stevens, Richard H. Fletcher, John Stern

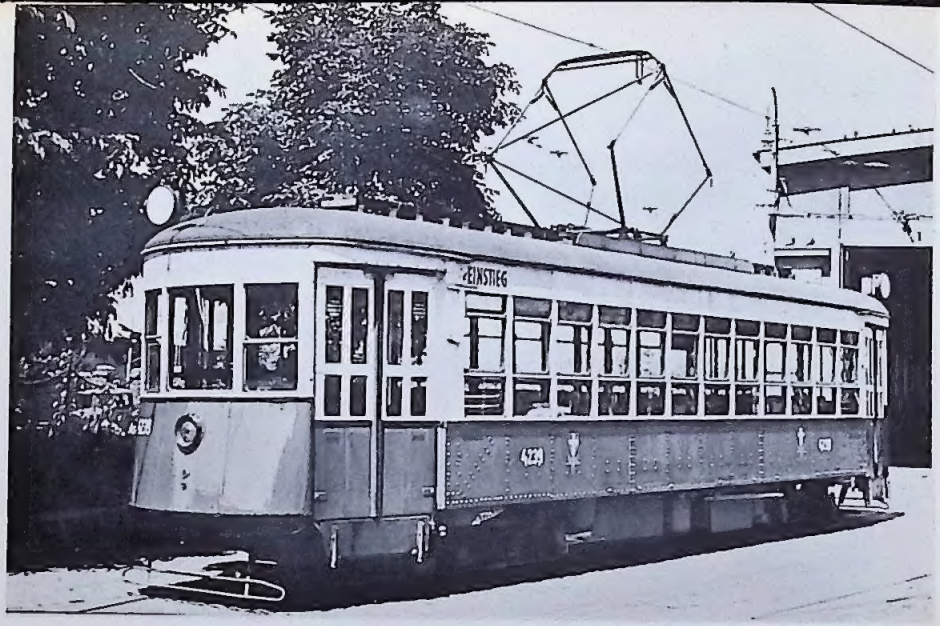
FOREWORD TO THIRD PRINTING

This sheet and the corresponding sheet just inside the back cover provide additional information and pictures of cars not included in the first printing. The timing of this Third Printing coincides with our Twenty-Fifth Anniversary year of 1970.

The development of the Museum has continued at a rapid pace since this booklet was first published in 1965. Recent support received from members and friends of the Association has made it possible to accomplish the following major construction projects: to replace the trestle over the river near the Sprague terminal; to rebuild a significant portion of the track using new ties and rails; to replace poles and portions of the overhead trolley wire; to extend barns and house additional cars; to extend the car shop and improve car maintenance facilities; to construct new yard facilities including a loop track for turning cars around; and perhaps of greatest significance to visitors, to rebuild and extend the main line out across the tidal marshes toward Short Beach, including the rebuilding of a large concrete culvert under the tracks. The recent donation of four acres of marshland has provided the necessary space for construction of a loop track to turn the cars around near the Short Beach terminal. The restoration of several street cars is also underway, but this is a meticulous process and progress is slow because the work is done by volunteers in their spare time.

We, the members of the Museum Association, take pride in the accomplishments resulting from twenty-five years of combined effort. Everything you see has been built or brought here by the members, except for the trolley main line tracks. We regret only that our active membership and available funds are not greater; an increase in each of these would ensure the earlier attainment of our goal of having more cars restored to operating condition and of having improved facilities for the display of the various car types. We have the continuing hope that your visit to the Museum or your reading of this Guidebook will be the beginning of a permanent interest in the Museum. Perhaps you will wish to accept the challenge of developing a better Museum and join our members in the work of preserving a bit of the Trolley Era for the coming years.

This picture was taken before the Museum came into being, when the line was operated by The Connecticut Company. Car 1902, a sister of our 1911, is shown running eastbound at Farm River Road crossing. The car is at the point on our present main line near the souvenir stand where 1425 is pictured on page 19, and where 1001 is shown on opposite page. The country lane is still there. *J. Koella*



This information supplements the lightweight car story on page 29 and the photos on page 32. 629 was built in the Third Avenue Railway System Shops in New York City in 1939. It was one of fifty-eight cars built that year which were very sophisticated "home made" cars which included the latest operating and control mechanisms. At the time 629 arrived at the Museum it was our most recently built passenger car, and the most widely travelled.

After the abandonment of street car service in Manhattan, forty of this type car were sent to Vienna, Austria in 1949 as a part of the Marshall Plan aid to war-torn European nations. Upon learning that these cars were being withdrawn from service, a group of members negotiated for one car to be preserved and arranged for its long trip back across the ocean. 629 (Vienna 4239) was donated to the Museum by the City of Vienna, Austria. Considerable assistance was also given by the Austrian Government.

Following eighteen years of Viennese service the native returned in 1967 to join the other Third Avenue cars preserved at Branford. Among these is 220, an ex-cable car, our oldest street car and also one of Third Avenue's earliest electric cars. Thus 220 and 629 span the complete historical development of Third Avenue electric cars.

Top: 629 shown as car 4239 at a Vienna carhouse. *R. Jackson*

Right: 679, a sister car, on the Tremont Avenue line at Webster in the Bronx, June, 1948.

R. Presbrey

FOREWORD

Street railways, and especially the trolley car, fill a colorful and memorable page in our country's history. They made it possible for cities to expand into today's suburbs; they broadened social contacts among the people; and they brought the country and city into closer contact.

Mass transportation had its beginnings in the 1850's with the inception of horse drawn cars running on rails. The need for larger cars of greater capacity led to the use of cable cars and the early stumbling attempts to harness electricity for transportation. The latter culminated in the first successful city-wide electric car installation at Richmond, Virginia, in 1888, engineered by Frank Julian Sprague. New systems then appeared rapidly, climbing to peaks of 45,000 miles of track and 100,000 cars in 1918. Fares were low and service frequent. Suburban and interurban lines criss-crossed the countryside and served hundreds of cities and towns. In 1913 it was possible (if one was patient and hardy) to travel by trolley and interurban such distances as between New York City and Sheboygan, Wisconsin (except for two short gaps in New York state served by steam railroad), or between Waterville, Maine, and Wilmington, Delaware. 1923 was the peak year for the number of passengers carried, when 14 billion paid fares were collected by the various operating companies.

Then the pattern began to change. While the trolley had served well for the transportation needs of its era, it was gradually supplanted by a newer product — the motor vehicle — which affected the trolley in two ways. The motor bus, running on public highways, eliminated maintenance costs and taxes on right-of-way, track and overhead wires; it was also cheaper to buy and to operate. The second effect was from the increasing use of private automobiles, which reduced the potential patronage for the trolley. The jitney and early bus often ran on routes paralleling the car lines, stealing customers in a price war where local regulations permitted. Then, as the trolley companies acquired buses, the lightly travelled lines were converted to bus service.

During the economic depression of the 1930's, the major transit companies made a serious bid to protect their investment and regain their riders by producing a new kind of street car. The successful result is attested today by the existence of several thousand "streamliners" in regular use in several American cities. However, the vintage trolley car can now be seen only at museums.

This brief outline sets the stage for the Museum's exhibits of this major industry which was relatively short lived, yet played a tremendously important part in our country's economic and social growth. While this is a guidebook to the museum, the text is narrative and tells a part of the fascinating story of street railways and their urban counterpart, the rapid transit systems. The history of this museum and its objectives are closely related to the central theme, and the stories intertwine.

Welcome to the Branford Trolley Museum!

Here you can find every significant type of street car — from Horse Car to Streamliner. During most of the year you can enjoy an old-fashioned trolley car ride as well. We are, however, entirely staffed by volunteer members and are not always able to have our barns open nor cars available for visitors. The Museum is devoted to the preservation of examples of one of the most colorful eras in our country's past — the Trolley era.

COME WITH US FOR A "RIDE DOWN MEMORY LANE".

DEDICATION

In acknowledgement of his many contributions to the electric railway industry, we dedicate this book to the memory of FRANK JULIAN SPRAGUE (1857-1934). Without his pioneering work the electric street railway, the subway, and the interurban would not have developed so swiftly.

Sprague was born in Milford, Connecticut, within fifteen miles of the Museum. He developed an unusual talent in mathematics at an early age. At age sixteen he was accepted at the United States Naval Academy, graduating in the Class of 1878. He utilized spare moments during his first cruise by preparing preliminary applications for sixty electrical patents! He continued his interest in the use of electricity by developing improvements to dynamos and innovations in speed control systems for electric motors. He finally resigned his commission as a naval officer to work in the electrical laboratory of Thomas Alva Edison in Menlo Park, New Jersey.

In order to devote full time to his own interests, in 1884 he formed Sprague Electric Railway & Motor Company, which was soon successful. Orders for his improved motors came to him from all over the United States and from Europe. It is now difficult to realize that the detailed arrangements for the practical use of an electric motor could ever have been a major problem, but in the 1880's it was. Beginning with motors mounted on the motorman's platform propelling the car by gears and chain drive, several other schemes were tried, but always with complications in keeping gears in alignment and in mesh and also in protecting motors from the jolting they received when mounted on the truck itself. Sprague devised the "wheelbarrow system" of motor suspension which is simple in principle, yet very practical, and was far in advance of the ideas of the other pioneers. A part of the motor was mounted directly on the axle, keeping the gears enmeshed, while the other end was spring mounted on the truck frame to absorb the jolting. The principle continues in use up to the present time.

In May, 1887, when twenty-nine years old, Sprague signed a contract to install a complete electric street car system in Richmond, Virginia. In ninety days he had to complete an electric generating plant; twelve miles of track, some up steep grades; forty cars with their motors and all other accessory equipment. The system was built despite several small failures which were corrected. Even the skeptical had to admit that the electric street car was a wholly practical mode of transportation. The line opened for regular service on February 2, 1888. By that summer all forty cars were running dependably and profitably. Following his success in Richmond, Sprague went on to electrify the much larger West End Street Railway in Boston.

In 1892 he developed a one thousand horsepower electric locomotive. The following year he began building the first modern electric elevator, along basic principles still used for vertical transportation in skyscrapers. In 1895 Sprague devised the multiple-unit control system for electric railway cars, in which several motor cars can be controlled from the lead car. This system was first applied on the Chicago "el" and is used today in subway and suburban electric trains the world over. In 1902 he invented the "deadman's" button, used on electric controller handles to stop a car or train in the event that the motorman becomes disabled. During World War I he assisted in developing depth charges and armor-piercing shells.

Sprague lived to see and ride the first experimental new street car resulting from the transit companies' Presidents Conference Committee's efforts to produce a radically new street railway vehicle. He died at the age of seventy-seven, still working on new inventions and laden with medals, degrees and honors.

Our Station Building, described later in this book, is a living memorial to Frank Julian Sprague as well as a reminder of his contributions to the electric railway industry.

Aerial view of barn-museum area, looking south toward Short Beach. Main line and barns in foreground, picnic grove in wooded island at upper right. *J. Stern*

THE BRANFORD ELECTRIC RAILWAY ASSOCIATION

Most visitors seem amazed at finding such an organization in existence. You will probably wonder just how this Trolley Museum came into being. Who founded it and when? What is the museum's purpose, and how is it supported? This brief history attempts to answer these questions. It is quite a story of hopes, failures, and small successes, but constant growth and improvement. A story of people and their contributions great and small, and their tremendous devotion and continuing efforts which have made possible the collection of cars and all else you see.

The museum had its beginning in 1945. Several electric railway enthusiasts realized that following World War II most of the nation's remaining streetcar and interurban lines would gradually disappear. They decided to find a suitable place where a variety of trolley cars could be preserved, exhibited, and operated for the enlightenment and enjoyment of the public. As a first step, several Connecticut men, under the leadership of Wadsworth G. Fyler, incorporated the Branford Electric Railway Association as a non-profit, educational institution in August, 1945.

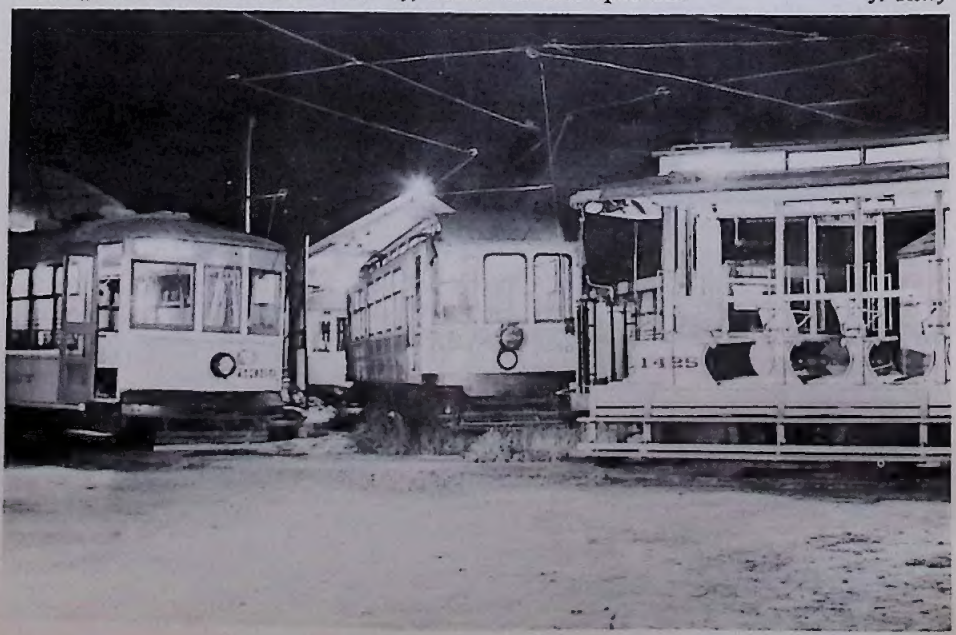
The approaching abandonment of the Connecticut Company's suburban trolley line to Branford solved the perplexing problem of finding a home for the museum. The private right-of-way portion of this line, between the end of River Street, East Haven, and Short Beach in Branford — complete with track, trestles, and overhead wire — was turned over to the new association for scrap price, when the trolley service terminated in March, 1947. The line had been built in 1902 by the Branford Electric Railway Company, after which the Association was named.

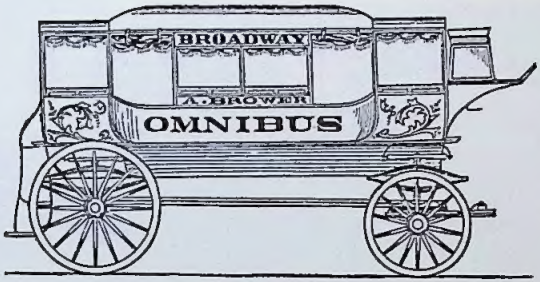
Work on the museum project then began in earnest. The first years were ones of great activity. By 1950, the museum boasted 27 trolleys, an 8-car quonset carbarn, yard storage tracks, and a gas-electric generator to power the trolleys. Tom Vaughan was of tremendous assistance to the museum during this period of expansion. Along with all this progress came a large debt, however, as enthusiasm for the project incurred greater expense than available funds could cover. Under threat of possible failure, interest in the museum lagged. Mr. E. J. Quinby, a pioneer electric railway historian, and founder of the Electric Railroaders Association, was alarmed by this threat, and took action to avert the possible failure of the museum. Twenty-year mortgage bonds were offered for sale, and the issue was soon sold out — mostly to museum members. The danger of foreclosure was averted.

Since that crisis in 1952, the museum has progressed steadily. Operation for our visitors began in 1953, and a program of car barn construction was embarked upon. The collection of cars has now (1965) reached 75, and includes every significant type from horsecar to streamliner, including interurbans and rapid transit cars, and a variety of service equipment. At the present time, 35 cars are sheltered and barn construction continues. The diesel-electric generator which served the museum faithfully from 1953 until 1963 has been replaced by two more efficient and dependable motor-generator units. The track has been almost completely rebuilt, with many new ties and good rail, along with reconstruction of both timber trestles. Half the poles supporting overhead wires have been replaced. A repair shop has been constructed, and several streetcars have been undergoing restoration work. The most significant and visible improvement is the construction of the Sprague Memorial building, donated to the museum in 1960 as a memorial to Frank Julian Sprague — the perfector of the electric street railway — "Father of Electric Traction".

These accomplishments have been made possible only by donations of time, labor, and money by the museum's members, and by the generosity of visitors who purchase souvenir tickets for trolley rides and often contribute as well.

Night portrait at the carbarns: Birney, Parlor car and open car. *J. Kelly*



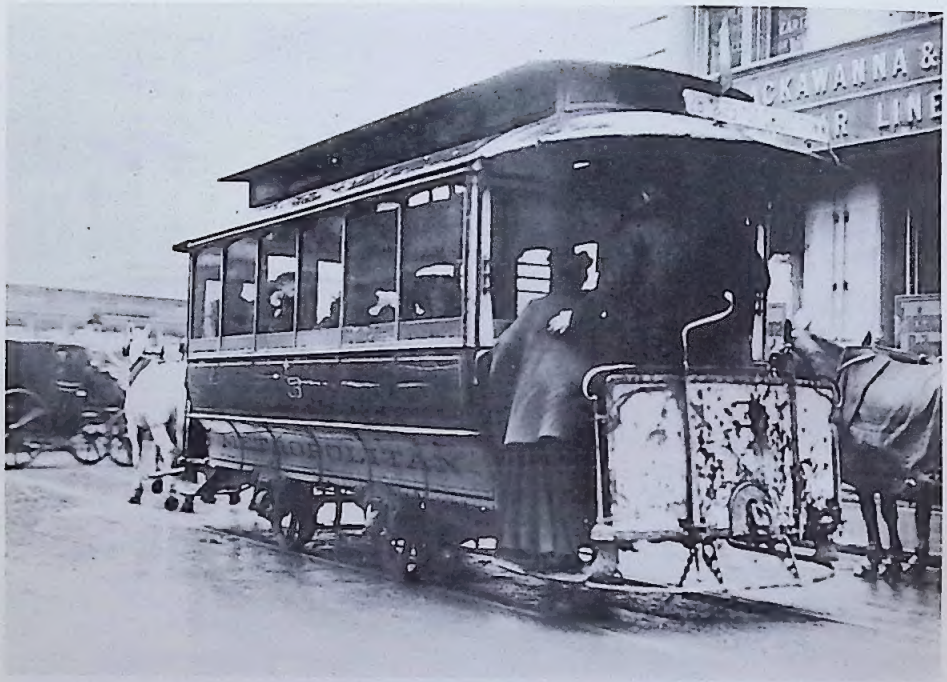


New York's first omnibus, built by John Stephenson in 1831 *From "Fares, Please".*

THE BRANFORD COLLECTION

The rapid urban population growth during the first half of the 19th century, especially to be noted in a metropolis like New York, meant that many workers had to live beyond convenient walking distance of their place of employment. This need gave rise in the 1830's to the horsedrawn omnibus. But by the middle of the century, city thoroughfares were being choked by these conveyances in competition with all sorts of commercial and private carts, wagons and carriages. A better means of transit had to be found, and since steam railroads then had the glamor and excitement in public imagination that rockets and space travel have today, it was inevitable that "street railroads" would be developed. Enterprising promoters had horse cars in operation on the streets of New York in 1832 (the world's first street railway), and in Boston and Philadelphia by the middle 1850's. These rapidly gained public favor due to their greater speed and comfort. The new street railroads made possible continued growth in large cities.

Horses and trolleys on Market Street, Philadelphia. About 1906.
J. Burchard from F. Dodge Collection

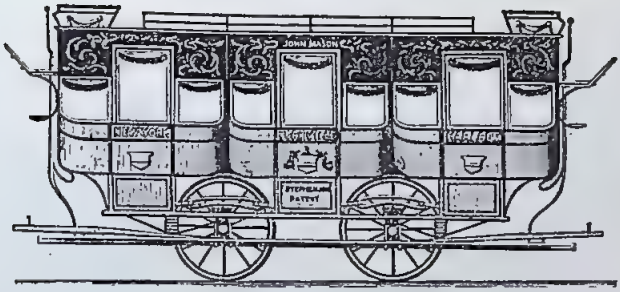


Horsecar #3 on W. 28th St., New York City in 1908. *E. B. Watson Collection*

HORSECARS

Early horsecars resembled the railroad coaches of the time. They had tall, narrow windows, and slightly arched roofs that extended as canopies over the end platforms. The lower part of the sides curved inward, like the body of an omnibus. They had four wheels; doors in each end of the body; and seats down each side within it. Since in many cities it was the custom to use cars on one line only, they were lettered on the side panels, dashers, and the panel above the windows (the "letterboard") with very complete information about the route served. They were brightly painted, and decorated by gold and silver striping. The driver stood on one end platform, where with his left hand he held the reins of the team of horses, and with his right he controlled the "gooseneck" hand brake. A conductor was stationed on the rear platform to collect fares and signalled the driver by means of a bell, when to stop or start.

The horsecar's popularity spread rapidly to many smaller cities through the 1860's, although from the start other users of the streets objected to the rails (which were raised slightly above the surface), as interfering with free-wheeling traffic. Early track construction was somewhat crude, with light iron strap rail of various designs screwed down to longitudinal wooden stringers, which were bolted to crossties. However, it was a much smoother surface than the contemporary unpaved or cobblestoned streets, and many free-wheeling vehicles, including omnibuses, took advantage of the rails. In some cities, street railways were compelled to use a gauge to accommodate other traffic, and this accounts for some of the odd track gauges used in cities like Philadelphia, Pittsburgh, New Orleans and Toronto. The museum possesses several specimens of iron horsecar rail from New York City.



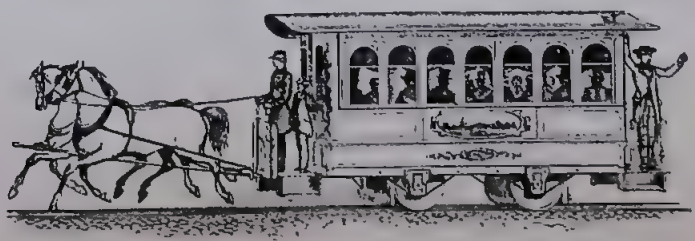
Pioneer street car, the "John Mason," built in 1832.
From "Fares, Please"

Horsecar design became refined, resulting in lighter, more handsome vehicles. The old heavy cars required two, or on occasion, more horses to draw them. Smaller cars for lightly used lines were built to be drawn by a single horse, and operated by the driver alone. The "bob-tail" was a single-end car that had to be turned on a small turntable at each end of its run. The most significant change in appearance was the form of the roof, which covered only the body of the car, separate hoods being supplied over the platforms. The main part of the roof was arched up in the middle, so that small windows could be put in the ends, and rows of small hinged windows were placed along all or part of the sides for both light and ventilation. The high point in roof design is exemplified in Third Avenue cable car 20, now restored to its early appearance as it was when converted to an electric car and re-numbered 220. The deck roof was introduced in the 1870's, and while not too commonly used for horsecars, became the standard roof type of early electric cars. Branford's horsecar 3 has this type of roof.

The firm of John Stephenson, located on 29th Street in Manhattan, pioneered in building omnibuses, and built what is reputed to be the first horsecar, the "John Mason" in 1832. It became the foremost builder of street railway equipment, and exported its products to all corners of the world. Branford horsecar 3 was built at the Stephenson Manhattan plant in 1893. It was operated on 28th Street by the Metropolitan Street Railway until horsecars were given up on that route in 1917. The John G. Brill Company of Philadelphia, after a later start, caught up with Stephenson in volume of production, and absorbed the pioneer firm after the death of its founder in 1893.

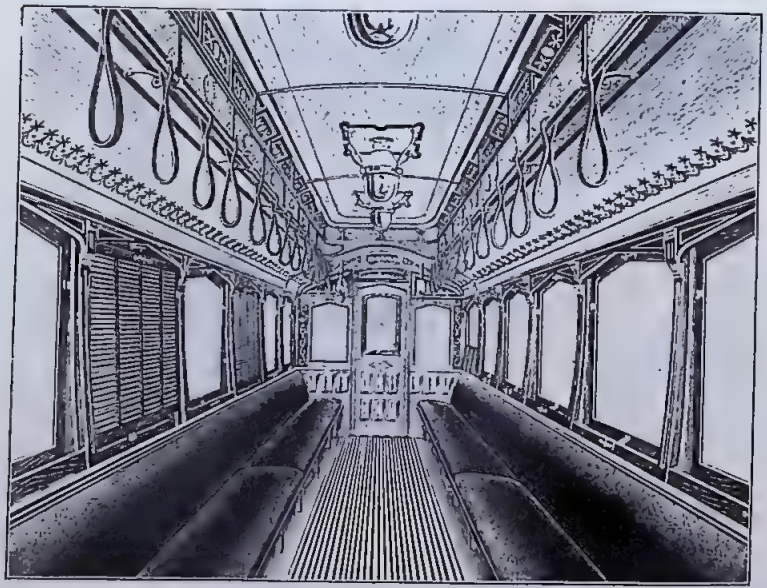
By the 1880's there were 18,000 cars and 100,000 horses and mules in street railway service in the United States.

Early horse cars resembled pioneer railway carriages.
From "Wheels Across America"



The Laclede Car Co.,

ST. LOUIS, MO.



INTERIOR OF CAR BUILT FOR THE THIRD AVENUE R. R. CO., NEW YORK CITY.

Builders of Street Cars of Every Description.

THIS CUT REPRESENTS ONE OF THE 200 CARS BUILT FOR THE THIRD AVENUE R. R. CO., OF NEW YORK CITY.

220, Branford's ex-cable car 20, is undergoing major rebuilding at press time. It will be restored as it was after conversion to an electric car about 1899. The reproduced advertisement shows a sister car when new.

The Street Railway Journal, December, 1893.

CABLE CARS

The cable system, in which cars are drawn by gripping an endless wire cable moving underground, was the most satisfactory alternative to horse traction until electric propulsion became practicable. Its invention in San Francisco in 1876 was particularly appropriate, owing to the steep hills that could not be climbed dependably in any other way. The "grip dummies" (power cars) were essentially mechanical horses drawing conventional horsecars as trailers. In later years the "dummy" and its trailer were combined in a single vehicle with both closed and open sections, as still may be seen and ridden on in the western metropolis.

The immediate success of cable traction in San Francisco induced many large cities to replace horsecars on their most heavily travelled routes. Not only could a cable system move more loaded cars faster and at less cost than the best of horses, but it permitted the use of larger cars, and even trains of several cars. Branford's Third Avenue cable car 20, later electrified and renumbered 220, was built in 1892. This car, while resembling a horsecar in the design of its roof—combining an "ogee" arch with a central raised "bombay"—was much larger than horsecars of its time, or even most of the early electric cars.

The great disadvantage of the cable system was the expensive conduit construction and winding machinery. It was vulnerable to street debris, and particularly ice and snow. Damage to the cable through wear and breaking of strands resulted in some bizarre accidents, and its replacement or repair meant a suspension of service.

ELECTRICITY

Until the opening of the system equipped by Frank Sprague in Richmond, Virginia in 1888, electric street railway propulsion had been in the minds of many pioneers. Germany, in 1879 saw the first successful application in a miniature line at the Berlin Industrial Exposition. This was designed by Dr. Werner Siemens, who over the next decade built a number of successful full-size systems.

In the United States, the experimenters were men like Vandepoele, Daft, Short, Bentley and Knight, and many others. Their imperfect installations left much to be desired, and were ridiculed by some at the time, but each contributed something positive to the knowledge that was available to draw on. Far-sighted street railway operators in Baltimore, Maryland, Cleveland, Ohio, and Montgomery, Alabama, sponsored the installation of electric systems on a larger scale. The improved system employed in Richmond by Sprague proved beyond any doubt the practicability of electric traction.

Improvement in the design and dependability of motors and control systems was rapid. Frank Sprague brought to practical usefulness the system that permitted the operation of a large number of cars from a central generating station, and in the control of this power from the overhead wire, through the "trolley" and to the motors. In a matter of a few years new improvements rendered existing equipment obsolete, and in turn were supplanted by better designs and methods. This is a partial explanation why, at Branford, there are a number of early cars, but none of them retain their original electrical equipment, either motors or controllers.

61 in its original condition, in Providence. *F. Williams Collection*

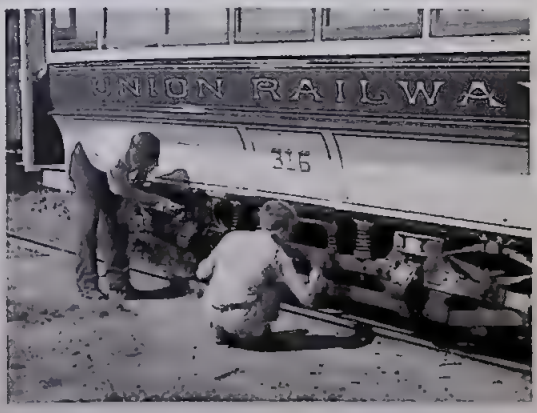
EARLY ELECTRIC CARS

While the horsecar had elaborate exterior decoration, the limit to its weight restricted interior flamboyance. Electric cars were not as limited in this way, and the ultimate in fine woods and carving, bevel-edge mirrors, and bronze fittings were lavished on them. Deep plush cushions replaced perforated plywood seats. Branford's 61 is probably the finest surviving example of an early electric car, and embodies all of the features described. It is in truly remarkable condition, especially considering that it was used for many years as a service car, carrying sand to the various car houses in Providence, Rhode Island before coming to the museum. It was built in 1893 for use on the Elmwood Avenue line in Providence, and was given a livery of red and cream to identify its route. Red glass in the clerestory— the raised part of the roof— served this purpose also. Other routes had cars painted distinctively purple, green, orange, etc., with decorative glass to match. Most cities found it advantageous to use route signs that could be changed, permitting cars to be sent where needed at any given time.

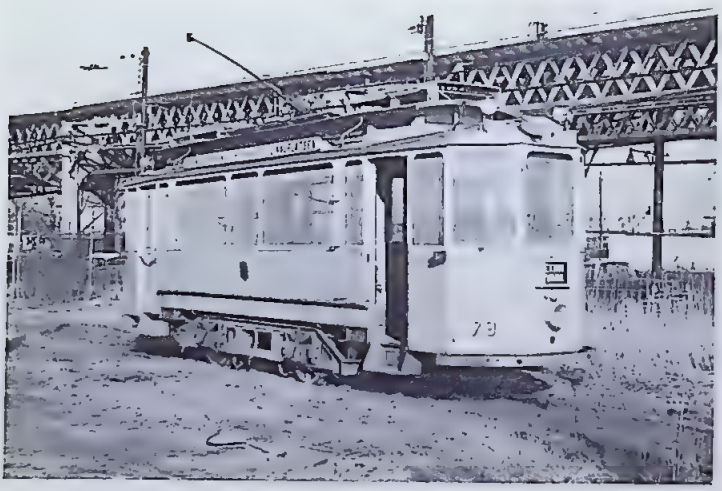
Car 316 represents the first car in any transportation museum to be fully restored by volunteer labor, and will give the viewer a good idea of the standards attainable in this work. It had also been a service car in its later years, and required considerable restoration of missing features. It was built in 1895 for the Union Railway, which operated in the Bronx and lower Westchester. It is said that this car and its sisters inspired the famous cartoon feature of Fontaine Fox — the "Toonerville Trolley".

316 as pay car no. 1. Note barred windows. *C. Salley*

Our first car completely restored. 316 in Union Railway red and cream livery. *J. Stern*



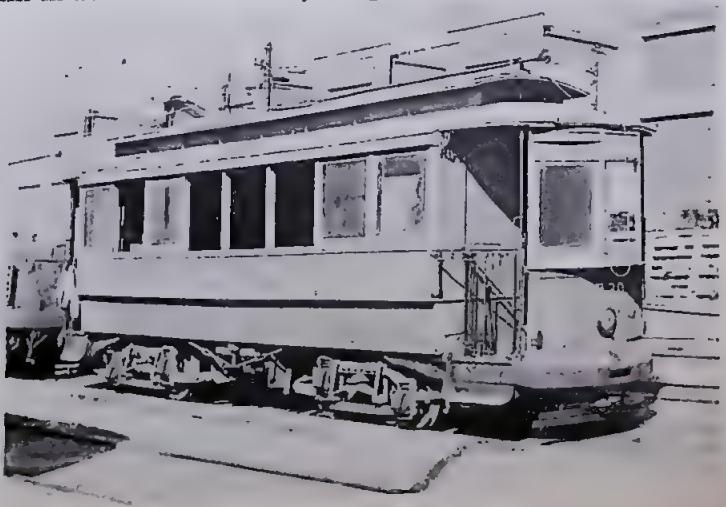
The finishing touches to ten years of restoration. *J. Stern*



Far from Sweden: a sister car to 71, in Brooklyn, 1961. *A. Lonto*

Car 71, the museum's first from Europe, was built in 1912 and operated in Gothenburg, Sweden. It is typical of continental European cars, many of which to this day are four wheeled. It makes an interesting contrast with North American cars like 316. Distinctive features of 71 are its extreme narrowness and very large plate glass windows. It is much more heavily built than an American single-trucker of 1909 would have been, as it was intended to pull trains of as many as 3 cars. Its power supply was picked up by a large pantagraph mounted in the middle of the roof, and braking was effected by a special type of controller, using the regenerative properties of the motors. The gooseneck hand brake actuated track brakes as well as the usual wheel brake-shoes.

Four-wheeled cars had poor riding qualities, as the wheel base had to be short enough to negotiate short-radius curves. Eight feet was generally the maximum wheel base. Various designs of double trucks were introduced both to give a better ride and also permit longer cars. The "maximum traction" truck used only one motor, and had unequal sized wheels. The small "pony" wheels in effect steered the larger powered ones, which bore most of the weight. The small wheels had a tendency to derail on switches. Car 1792, built in 1899 for the Brooklyn Rapid Transit System, is an early



1792 (when renumbered 9730) in sand hauling service in Brooklyn.

830 at Van Cortlandt Park in The Bronx. *K. Grob*

double-truck car that was originally equipped with an earlier type of maximum-traction trucks than it now has. It was built with open platforms, and was later equipped with portable windows. This car was designed to be used in the winter only, and its windows do not open. In the summer, its body was stored on trestles, and the trucks used under an open body. It had hand brakes only, when built.

Third Avenue car 830 is typical of many hundreds of early electric cars used across the country in the early 1900's, and is also a representative product of the J. G. Brill firm, with its characteristic high clerestory. It was built for two-man operation, and the body was separated from the platforms with bulkheads containing sliding doors. In later years, air-operated folding doors were installed, and the bulkheads removed. For one-man operation, it was given safety controls which will be discussed later. A peculiarity of Third Avenue operating practice is the foot-operated brake valve. This car was always equipped with air brakes.

All of the street cars discussed so far have the curved-side feature inherited from the early omnibuses. Some early electric cars were built with flat, matchboarded sides, but the traditional curve-side predominated until the adoption of steel construction. New Jersey Public Service car 2431, built in 1913, is a late example of a curve-sided car, although in it the side panels are of metal rather than the usual whitewood.

2431 on the Museum's railway. *J. Koella*

775 in service at West Haven, Conn. *F. Bennett*

Above: 865 was built specifically for the line the Museum now operates. *J. Koella*

Below: Pictured on one of our trestles, 1199 originally ran in Stamford, Conn. *J. Winslow*

1339 at Yale Field. *H. Hamilton*

STRAIGHT-SIDED CARS

New cars built for the Connecticut Company (or its predecessors) after 1900 for suburban service imitated the appearance of steam railroad coaches with their match-boarded sides and deck-roof ends. The museum has five of these cars, built between 1904 and 1911. After the suburban lines for which they were built were abandoned, they were brought into New Haven and used for rush hour service, until trolley service was given up in 1948. All have been altered to some degree, but are essentially as built in all major respects. The narrow entrance doors and high, narrow steps made them undesirable for city use, by slowing entrance and exit of large numbers of passengers.

The most handsome, and the oldest of these cars is 775. Its unusual window arrangement is noteworthy. The only internal change was the removal of the double sliding bulkhead doors. All the interior body trim is mahogany—the post caps being inlaid. Ceiling panels of wood veneer are painted Paris green, with silver striping. Later cars were successively plainer, (865, 1199, and 1339) and 1602 has a plain deck roof. The latter is the only car in the group to have longitudinal seating. These cars were operated by a two man crew much of their long, active lives, and are a testimony to the car-builder's art.

Shown here at James St. car barn, 1602 served on New Haven local lines. *R. Gale*

OPEN CARS

It happened every Spring—as Mother Nature put on her best dress, an American Institution rumbled out of car barns all over the land and went forth to serve a delighted public. This was the open trolley car, with crosswise benches reached by a running board extending the length of the car. It had a summertime ventilation system infinitely superior to any other. The conductor moved precariously from bench to bench while the car was in motion, collecting fares. Many people took "a ride on the open car" just for the fun of it, or to escape the sultry summer heat. The open car was the ideal vehicle from which to view nature's senic wonders in the country—or one's own city neighborhood. Churches, lodges and clubs organized open car excursions and picnic parties. On festive occasions an open car, completely festooned with colored lights and gay bunting, carried an orchestra or brass band, followed by a half-dozen cars filled with singing couples in a holiday mood.

The first primitive open cars made their appearance in the 1870's. The earliest ones were rather flimsily built, lacking the end bulkheads that served to reduce wracking of the body in later designs. The seats were usually reversible and at first the backs consisted of only a board with pivoting brackets. Cars with facing seats like Branford's 11 (a reproduction of a car built for the Toronto Street Railway in 1880) were found in many cities, although not so common. Some open horsecars did not have a permanent roof, but merely a framework on which a gaily-colored tarpaulin could be stretched in inclement weather. Standard open cars had side curtains that could be lowered to seat level to afford some protection from sudden showers. Open cars were so popular that they were used whenever possible. However, the sudden shower caused equally sudden dispatching of closed cars to meet the opens where best they could along the line to rescue the damp patrons and the often very wet motorman.

The use of electric propulsion permitted more rugged construction than formerly, but design details did not change much, as can be seen in car 34, built for the Lynchburg Street Railway in 1899, and used for the latter part of its long life on the Five Mile Beach Railway at Wildwood, New Jersey. Incidentally, this car was the first piece of equipment owned by the museum.

Horse Car 11 from Toronto, Canada. *J. Stevens*

Southern belle from Virginia and a Connecticut Yankee at Farm River Road (ex-Lynchburg 34 and New Haven 1414) *J. Kelly*

There are four other open cars at Branford built for the Connecticut Company or its predecessors. They are essentially alike, but are the product of three different builders, and were built between 1901 and 1911. Numbers 614 and 923 were built with single running boards, 923 is distinguished by steam-coach ends to its deck roofs. Numbers 1414 and 1425 are not as finely detailed as are the two older cars. The survival of these opens after their general use had been abandoned elsewhere, is due to the Yale Bowl games. A fleet of 100 open cars was kept in reserve in New Haven specifically to handle the huge crowds attending football games at the Bowl. These were the only trolleys that could cope with the overwhelming traffic load generated by those games. Passengers crowded on to and into, any part of the car: seats, running boards, and even on the roofs! The unusual caravan would crawl up Chapel Street, almost bumper to bumper, with passengers hanging on like flies. After the last game of the season, the opens would return to their barn to collect dust until the following year, or until used for an occasional charter party. One of these cars is frequently operated at the museum. Your ride on an open trolley will be the highlight of your visit—the most appropriate vehicle for your "Ride Down Memory Lane".

The last open cars built in America were constructed in the shops of New Jersey Public Service, in 1916. The economics of a car which hibernated most of the year made the open car a luxury for street railways faced with ever-increasing costs. The beloved "breezers" began to disappear around 1920. Brooklyn and the Bronx lost theirs in 1932, and they disappeared for Manhattanites and New Jersey people in 1936. The rare open car, like our 34, survived on small lines that served summer communities. The large number of Connecticut Company opens survived only to fill one special function.

Above: 614 on a charter trip many years ago. *J. Winslow*

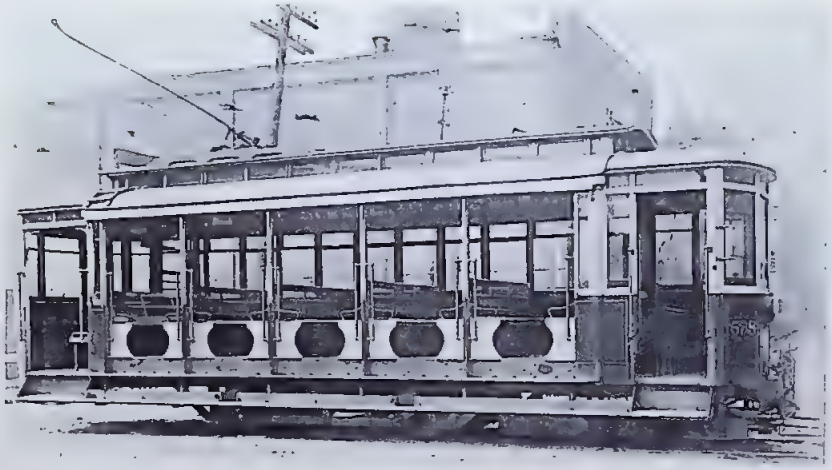
Center: 923 on typical wooded right of way. *J. Stern*

Opposite: Big 15 bench opens handled record football crowds to Yale Bowl.
J. Koella and J. Stern

Below: 1414 departing from Sprague. *J. Kelly*

YALE
DOME

DOME



CONVERTIBLE AND SEMI-CONVERTIBLE CARS

The idea of a combination car that could be used fully or partly open in the summer, and yet be suitable for winter service, appealed to street railway managements. Designs for convertible cars date from horsecar days. John Stephenson built one in the 1880's which had a center aisle and removable side panels.

In 1892 Cleveland Railways built a number of single-end electric cars so arranged that the curb side was completely open in the summer. In wintertime, panels were set in all but the center opening, which was used as an entrance and exit. The J. G. Brill Company patented a design in which the window sash and flexible lower panels slid up into a compartment between the ceiling and roof. The running board folded up when not in use. This arrangement allowed rapid conversion to suit weather conditions.

Toronto Railway 1706 is one of a very few fully convertible cars that have survived. It is technically a "half-convertible" inasmuch as it is a single-end car with the side away from the street curb constructed as a closed car. It had paired back-to-back summer seats like horsecar 11, but in winter the seats were re-arranged longitudinally along the sides, and a stove installed.

Above: A sister to 1706 ready for summer service in Toronto. *L. Pursley*

Below: 1706 as restored. Panels are in place for winter use. *J. Stern*

Left: 884 with panels removed, in summer service. *J. Winslow*
Right: 884 "converted" for winter weather. *J. Koella*

A superior convertible design is exhibited in cars 884 and 4573, both of which have panels with fixed glazing that are replaced with metal grills in the summer. These were the last types of convertibles used in America, having been operated in Manhattan and Brooklyn, respectively, until 1947. Elevated cars 1349 and 1362 have the same convertible feature as 4573 and were built for the Brooklyn Rapid Transit Company.

The semi-convertible is more truly classed as a closed car, being designed to allow maximum openness by having large windows that can be completely stored away in the roof or side wall pockets. The best known design was that invented by the Brill Company. It can be seen in cars 650 and 1911.

4573 ready for warm weather operation. *J. Stern*

PAY-AS-YOU-ENTER CARS

Until 1905 fare collection on closed cars was a haphazard arrangement, as the conductor had to determine by passing through the car who had, or had not, paid fares, and to examine transfers. On many systems, he had also to "ring up" paid fares on a clock-like fare register mounted overhead. This acted as a check on his receipts, to prevent possible pocketing of money to the detriment of the company. He had also to watch the steps to signal the motorman when it was safe to start the car. Under this system many passengers became adept at evading payment of fare—this was especially easy on crowded rush-hour cars.

The answer to this problem was to station the conductor in a position where all who entered the car had to pay as they passed him. This was the "Pay as You Enter" system, known by the patent abbreviation of "P.A.Y.E.". The loading platforms were lengthened to accommodate large numbers of passengers, and so prevent starting delays. Separate bulkhead doors and barriers separated the entering and leaving passengers. This system was introduced in Montreal, Canada in 1905, and was soon widely adopted. Montreal Tramways car 1403 is a characteristic single-end car with the original P.A.Y.E. design. Its rear platform has been protected by the addition of air-operated folding doors. Third Avenue Railroad cars 830 and 884 and New Jersey Public Service 2431 were originally P.A.Y.E. cars.

A sister to 1403 in Montreal. *F. Bennett*

A sister to 650 in original condition, passes below the Capitol in Washington, D.C.
F. Dodge Collection

CENTER ENTRANCE CARS

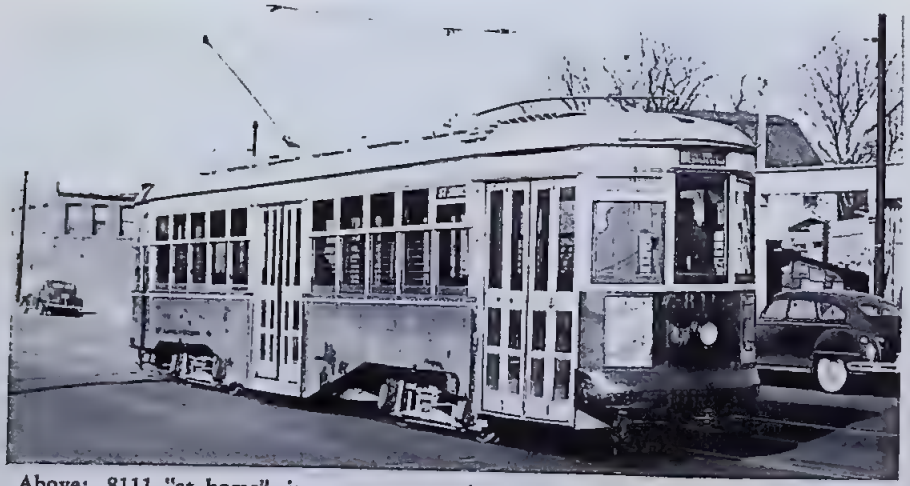
Another solution to the fare collection problem was the center entrance car. The conductor was stationed by the doors in the middle of the car, where there was sufficient space to accommodate a large number of boarding passengers, waiting to pay their fares. This, like the large end platform, made shorter stops possible. Branford's 650, built in 1912 by Brill for the Washington (D.C.) Railway & Electric Company, is an experimental unit designed to test such operation, and with some modification, was followed by a fleet of similar cars. The principle was not too widely adopted, but large fleets of center entrance cars once ran in Boston and Los Angeles.

The center entrance feature was further extended in the use of trailer cars, which had a brief popularity in some larger cities before the Depression caused widespread drops in passenger volume.

PETER WITT CARS

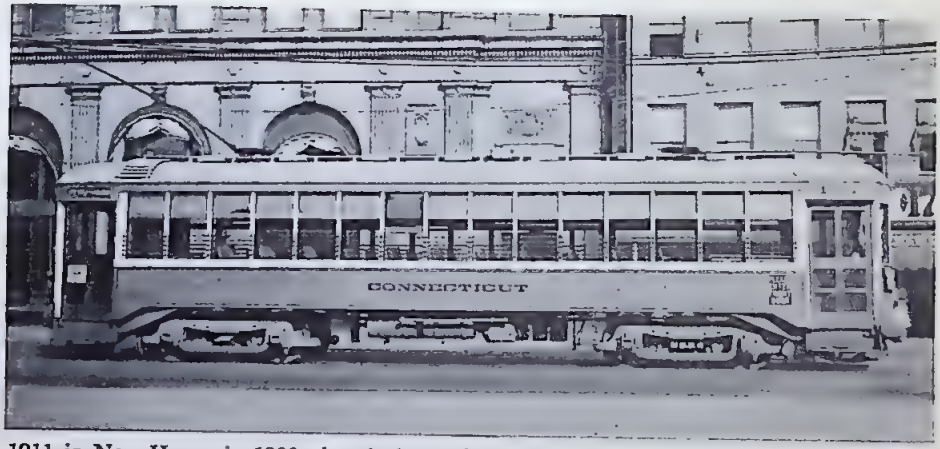
The major drawback of the center entrance car resulted from the congestion caused by passengers attempting to enter and leave by the same doorway. To alleviate this problem, Cleveland Traction Commission's Peter Witt designed the type of car that later bore his name. In it, the passengers boarded at the front of the car and paid their fares to the conductor, who was stationed just in front of the center exit doors. The front half of the car was a kind of reservoir where passengers could stand or sit prior to paying or sit in the more comfortable cross-seated rear part.

This system proved to be very successful, and was adopted by many large city systems. Older center entrance-cars were modified to the new plan. Brooklyn 8111 and Toronto 2898 are both representative Peter Witt cars, but both were altered to one-man operation in the 1930's to combat rising labor costs. The single-end design for Peter Witts predominated.



Above: 8111 "at home", in revenue operation. *J. Stern*

Below: 2898 in Toronto. Note curved rear end. *J. Stevens*



1911 in New Haven in 1933, then in interurban service.

CHANGES IN DESIGN AND CONSTRUCTION

Until the First World War, most streetcars retained features inherited from the horsecar era: the deck roof, separate platform hoods, largely wooden construction, and platforms that looked like added-on extensions to the body of the car. This haphazard appearance is probably due to the fact that motorman's windows were added to originally open platforms, as in the case of our 316; and even later, doors were added at the platform steps. It is logical to assume that the builders of the first new cars with enclosed platforms would copy the pattern of the earlier composite arrangement. Motors were large for their horsepower, and were used—in city cars—with short wheelbase trucks with 33 inch chilled-iron wheels. The large wheels meant a high floor level, and correspondingly high steps. At this time most large city systems were replacing all their 4-wheel hand-braked cars with more efficient double truckers. Some of the old 4-wheelers survived, later to be preserved by the museum owing to their new uses as service cars. Examples of such at Branford have already been mentioned: 220, 61, 316, 1706.

A sister to 850 runs amid shrubs and greenery in New Orleans. *J. Stern*

Steel began to replace wood, at first for underframe construction. The proportion of metal to wood became reversed. Connecticut Company car 1911 was built by Brill in 1919 with steel side plates that gave longitudinal stiffness and eliminated the need for heavy side sills. However, this car still has wooden posts dividing the windows. By 1920 the entire body framing was generally of steel. The complicated deck roof gave way to the much more simply constructed arch roof design, in which the platform hoods were integral with the main roof. Patent ventilators took the place of the monitor sash ventilators. This body construction and modernized features are well illustrated in Montreal Tramways single-end car 1403, built by the Ottawa Car Company in 1914. Its general body lines follow the usual Montreal pattern (narrow front vestibule, sides sloping in above the window sill) evolved at the beginning of the century. More typical is New Orleans Public Service car 850, built in 1922 by the Perley A. Thomas Car Works, at High Point, North Carolina.

Ornate interior trim of carved and veneered woods, mirrors, plush seats, etc. gave way to utilitarian wooden, or rattan covered seats, enamelled stanchions and grab rails, and simpler shapes and forms that facilitated cleaning. The result was more sanitary, if less pleasing to the eye. Some cars, like 8111, had concrete floors so that they could be flushed out with a hose.

Birney 2350 from Middletown, Conn. Restoration of exterior and interior completed in 1965.
R. Fletcher

Double truck Birney 3000, shown in New Haven, once ran in Torrington, Conn.
R. Wonson Collection

ONE-MAN OPERATION

As a result of automobile competition, street railways were beginning to suffer revenue losses even before the First World War. This problem was aggravated by constantly rising labor and material costs. Many lines which had not been fully economically justified when built, were abandoned. Primitive gasoline busses were making their appearance, and the trolley-bus was being used successfully in Europe. A further bitter pill was the "jitney"—privately owned automobiles used as omnibuses that stole passengers from the curb, right at streetcar stops!

In the face of this situation Charles O. Birney, of the Stone and Webster holding combine that operated trolley systems all over the country, designed a small, light car, practically a revival of the bob-tail horsecar. It had improved smaller motors that allowed using smaller wheels (27 inch), and so a lower floor and steps. It was operated by one man. The controller had a safety feature which was interlocked with the door, to prevent the car from being operated with the door open, and, even more important, brought the car to a safe stop in event of a mishap to the motorman.

The "Birney Safety Car" was supposed to obtain savings, because it could be run over badly-worn track, and so postpone rail replacement. Also, since "Birneys" were relatively cheap, more of them could be put on a line, so that if a passenger missed a car, another would soon be in sight. Unfortunately, the 4-wheel "Birney" rode badly on worn rails, and even on the best roadbeds their peculiar bouncing gait left much to be desired. Their characteristic riding quality can be experienced on the Branford line, in Connecticut Company's "Birney" 2350, now restored to almost new condition.

The first experimental "Birneys" were in use in 1915, and hundreds were built into the early 1920's. Double truck "Birneys" were also built, like Connecticut Company 3000, which had treadle exit doors installed later. While the small cars were not really successful, Birney's principle of one-man safety operation was applied to new rolling stock, as was the new light-weight body construction combined with smaller motors of increased horsepower. Many older cars were rebuilt with safety equipment for one-man operation. Examples of this at Branford include cars 830, 884, 2431, 8111, 2898.

Among the lightweights at the museum are two from Johnstown, Pennsylvania —356 and 357—which do not have safety controls. Also built in 1926, and having characteristic Cincinnati Car Company features, is Atlanta, Georgia car 948. Of note are its sliding doors, and the pressed steel bumpers. Its deck roof is an unusual feature for so late a date. Two cars from Montreal—1972 and 2001—represent single- and double-end examples of the same basic type. These were constructed in 1929 by the Canadian Car and Foundry Company. Most Montreal cars were single-end, a relatively small number of double-end cars being used on suburban runs. Boston Elevated Railway car 5706 is the ultimate in an economy model. Everything possible has been done to reduce weight, so that it weighs only 15 tons, as compared with 17 to 20 tons for other lightweights at the museum. Representative Boston features are the large center end windows, and the flat dash panels which permitted easy replacement. It was built for use on heavily-travelled city lines, and has wide doors and long platforms.

Steel began to replace wood, at first for underframe construction. The proportion of metal to wood became reversed. Connecticut Company car 1911 was built by Brill in 1919 with steel side plates that gave longitudinal stiffness and eliminated the need for heavy side sills. However, this car still has wooden posts dividing the windows. By 1920 the entire body framing was generally of steel. The complicated deck roof gave way to the much more simply constructed arch roof design, in which the platform hoods were integral with the main roof. Patent ventilators took the place of the monitor sash ventilators. This body construction and modernized features are well illustrated in Montreal Tramways single-end car 1403, built by the Ottawa Car Company in 1914. Its general body lines follow the usual Montreal pattern (narrow front vestibule, sides sloping in above the window sill) evolved at the beginning of the century. More typical is New Orleans Public Service car 850, built in 1922 by the Perley A. Thomas Car Works, at High Point, North Carolina.

Ornate interior trim of carved and veneered woods, mirrors, plush seats, etc. gave way to utilitarian wooden, or rattan covered seats, enamelled stanchions and grab rails, and simpler shapes and forms that facilitated cleaning. The result was more sanitary, if less pleasing to the eye. Some cars, like 8111, had concrete floors so that they could be flushed out with a hose.

Birney 2350 from Middletown, Conn. Restoration of exterior and interior completed in 1965.
R. Fletcher

Double truck Birney 3000, shown in New Haven, once ran in Torrington, Conn.
R. Wonson Collection

ONE-MAN OPERATION

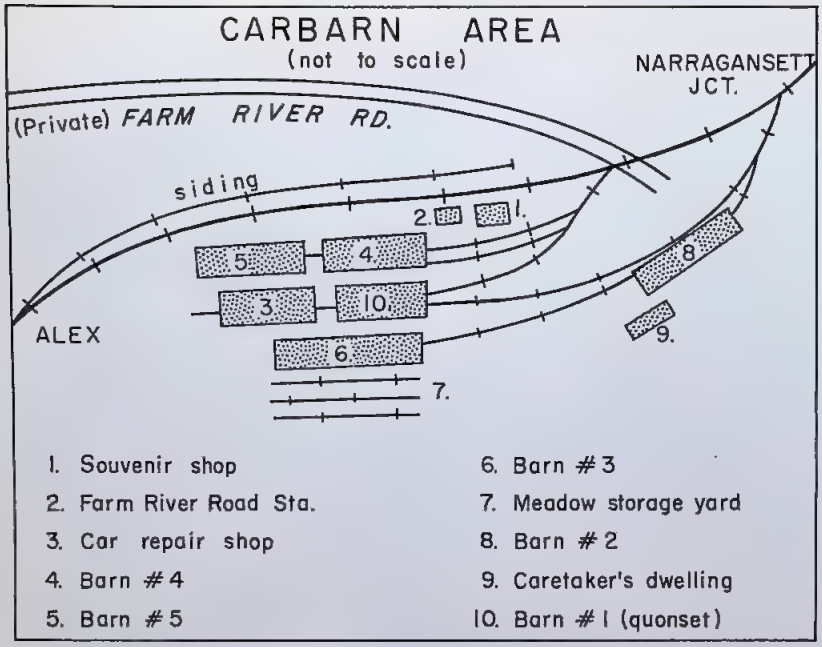
As a result of automobile competition, street railways were beginning to suffer revenue losses even before the First World War. This problem was aggravated by constantly rising labor and material costs. Many lines which had not been fully economically justified when built, were abandoned. Primitive gasoline busses were making their appearance, and the trolley-bus was being used successfully in Europe. A further bitter pill was the "jitney"—privately owned automobiles used as omnibuses that stole passengers from the curb, right at streetcar stops!

In the face of this situation Charles O. Birney, of the Stone and Webster holding combine that operated trolley systems all over the country, designed a small, light car, practically a revival of the bob-tail horsecar. It had improved smaller motors that allowed using smaller wheels (27 inch), and so a lower floor and steps. It was operated by one man. The controller had a safety feature which was interlocked with the door, to prevent the car from being operated with the door open, and, even more important, brought the car to a safe stop in event of a mishap to the motorman.

The "Birney Safety Car" was supposed to obtain savings, because it could be run over badly-worn track, and so postpone rail replacement. Also, since "Birneys" were relatively cheap, more of them could be put on a line, so that if a passenger missed a car, another would soon be in sight. Unfortunately, the 4-wheel "Birney" rode badly on worn rails, and even on the best roadbeds their peculiar bouncing gait left much to be desired. Their characteristic riding quality can be experienced on the Branford line, in Connecticut Company's "Birney" 2350, now restored to almost new condition.

The first experimental "Birneys" were in use in 1915, and hundreds were built into the early 1920's. Double truck "Birneys" were also built, like Connecticut Company 3000, which had treadle exit doors installed later. While the small cars were not really successful, Birney's principle of one-man safety operation was applied to new rolling stock, as was the new light-weight body construction combined with smaller motors of increased horsepower. Many older cars were rebuilt with safety equipment for one-man operation. Examples of this at Branford include cars 830, 884, 2431, 8111, 2898.

Among the lightweights at the museum are two from Johnstown, Pennsylvania —356 and 357—which do not have safety controls. Also built in 1926, and having characteristic Cincinnati Car Company features, is Atlanta, Georgia car 948. Of note are its sliding doors, and the pressed steel bumpers. Its deck roof is an unusual feature for so late a date. Two cars from Montreal—1972 and 2001—represent single- and double-end examples of the same basic type. These were constructed in 1929 by the Canadian Car and Foundry Company. Most Montreal cars were single-end, a relatively small number of double-end cars being used on suburban runs. Boston Elevated Railway car 5706 is the ultimate in an economy model. Everything possible has been done to reduce weight, so that it weighs only 15 tons, as compared with 17 to 20 tons for other lightweights at the museum. Representative Boston features are the large center end windows, and the flat dash panels which permitted easy replacement. It was built for use on heavily-travelled city lines, and has wide doors and long platforms.



Pile trestle

ROCK QUARRY

Turnpike Exit # 54
& Branford
center 3 miles

U.S. RTE. 1

BEACON HILL

NARRAGANSETT JCT.

PICNIC GROVE

FARM RIVER (Private) RD.

ALEX

CARBARN AREA
(see detail above)

RIVER

SPRAGUE BLDG.

trestle

EAST HAVEN

U.S. RTE. 1

MAIN (CONN. 142)

ST.

RIVER

Turnpike Exit # 51
one mile
& New Haven
3 miles

THE GREEN

HEMINGWAY AVE.

EAST HAVEN (CONN.

THE BRANFORD TROLLEY MUSEUM

OPERATING BETWEEN EAST HAVEN GREEN AND SHORT BEACH, ON A PRIVATE RIGHT-OF-WAY THROUGHOUT

KEY OF SYMBOLS

- Branford Electric Railway
- roads
- salt marsh

SCALE OF FEET

0 500 1000 1500 2000

Above: 2001 at Remembrance terminal loop, Montreal. *J. Stern*

Below: 357 approaching our East Haven terminus. *R. Wonson*

Left: A duplicate of our 948 in Atlanta. *W. Riccitelli Collection*

Right: 5706 in Boston subway-surface service. *E. Anderson*

THE STREAMLINER GLIDES ONSTAGE

By 1929, patronage on the nation's street railways was showing an alarming decline. True, part of this was due to both the automobile and the Depression, but a formidable factor was the trolley itself, by then considered old-fashioned. It was unattractive; it was noisy; it was slow.

Many efforts were made to produce an ideal street car by car builders and transit companies. Some of these productions were quite unconventional, and closely resembled busses of the time. None had any lasting success.

Finally, in mutual desperation, traction company executives joined together to call a conference. Its purpose: to develop a radically new streetcar without the objectionable features of the cars then in use. A million dollars was earmarked for the project, which was directed by Prof. C. F. Hirschfield of the Detroit Edison Company. It was believed that a non-streetcar man would have fewer preconceived ideas on a subject demanding an entirely fresh outlook. The President's Conference Committee went to work, testing everything imaginable to find "a better way to do it." Acceleration, brakes, lighting, heating, seating, ventilation, noise, springing—everything about a trolley was probed and thoroughly studied.

The results of the experiments were made known in 1934, and transit companies placed orders for the new cars in the following year. In 1936, the first of the "million dollar streamliners" rolled out of the St. Louis Car Company shops into the sunlight. This was car 1001 of the Brooklyn-Manhattan Transit Company, which is now at the museum, fully restored. The hearts of trolley men pounded in anticipation as the P.C.C. car (Presidents' Conference Committee) was about to revolutionize the transit industry. The new car was radically different from those then in use. New-type braking made use of both air and electricity in three separate braking systems (air, dynamic, and magnetic) to assure dependable stops (the magnetic brake could grip the rails even through oil or wet leaves). Acceleration was speeded and made smoother; lighting and seating improved; forced air heat and ventilation introduced. Alloy steel reduced the car's weight, and rubber inserts in wheels and springs reduced noise and smoothed the ride.

The new streamliners met with general popularity wherever they were placed in service. More than 4,500 P.C.C. cars were eventually built in North America, and their design features may be found now on street railway cars and rapid-transit cars both here and abroad. While it is unlikely that any more surface trolley cars will be built in the future for use in this country, many of the existing P.C.C. cars will be running in cities like Philadelphia, Boston, and Toronto for many years to come.

1001 — the first streamliner and likely the last design to be built. *F. Pfuhler*

M&SC No. 9 moves majestically down Mill St., Montreal in 1955. *O. Lavallee*

INTERURBANS

For the traction industry, all was not city streets. Perhaps the most colorful and fascinating segment of the industry was the network of interurban railways—and the varnished, arched-window speedsters which polished the rails of these lines. These were electric lines that were built cross-country between cities, largely between 1900 and 1915. The central states—Ohio, Indiana, Illinois, Michigan, and Wisconsin—were the heartland of the interurban, with more than 5,000 miles of intercity trackage. For a brief time it was possible to travel the 860 miles from Little Falls, New York, to Sheboygan, Wisconsin, entirely by connecting interurban lines. A patient rider could travel from Maine to Delaware, but mostly on local and suburban trolley lines.

The interurban evolved from a blend of city streetcar and steam railroad coach, and was a strictly American invention. Never was there an industry that aroused so much sentiment, for and against itself; that was so great a source of local pride; and that had so little chance of financial success. Yet the lines were built, and from the 'nineties until Johnnie marched off to do battle with the Kaiser, the big electric cars were the way to travel. They were clean—no smoke or cinders. They were fast—some were capable of 70 miles an hour or better. Service was frequent and convenient, the cars made frequent stops, and ran usually every hour or two (in contrast with the once-in-a-blue-moon local steam train). People in rural areas were no longer limited to the range of a horse-and-buggy. The isolation of the country was ended, and now the conveniences of the city were brought to many hundreds of rural communities.

Above: 250 in rural West Virginia.

Center: North Shore 709 at the museum. *E. Bond*

Bottom: 116 on her original owner's line in Ohio. *B. Neuberger Collection*

Branford has two wooden interurban cars from the "golden age" before World War I. Fairmont and Clarksburg Railway (West Virginia) 250 was built by the Jewett Car Company of Newark, Ohio, in 1904. It is not much longer than a standard city streetcar, but is much more heavily built. It is a "combine" with a baggage compartment at one end; wooden seats in this compartment accommodated additional passengers. The semi-elliptical transoms over the windows are filled with opal glass. Car 9 of the Montreal and Southern Counties Railway was built in the shops of the Grand Trunk Railway in 1911. It was originally a combine, like 250, and now has a smoking compartment in what was once the baggage section. It also has ornamental glass in its transom windows. Both cars have Tomlinson radial couplers. No. 250 is equipped with multiple-unit controls which permitted it to be run in trains with similarly-equipped cars. No. 9 on occasion pulled trailers of similar design.

The private right-of-way interurban lines across open country permitted higher speeds than were practical within built-up areas. Accordingly, bigger, heavier and faster cars were developed for inter-city runs. Representative of the fast, heavy cars is Chicago, North Shore and Milwaukee car 709, built by the Cincinnati Car Company in 1924. It is of all-steel construction, has doors in the ends and a lavatory. It has a complicated multiple-unit control system, and radial couplers of standard railroad type. Cars like this were run in trains of up to 7 cars, and at speeds of 75 miles an hour or more.

Following World War I, and the public acceptance of Mr. Ford's "Model T", the appeal of the interurban faded. As paved or improved roads spread across the country, the weaker interurban lines began to follow the buggy-whip industry into memory. By 1929, many of those remaining began to tighten their belts and sought to survive through aggressive selling, cost-cutting, and innovation. The latter was by far the most interesting form of attack on the economic decline, and the most spectacular form of innovation came about in 1930.

The Cincinnati and Lake Erie Railway was a consolidation of lines that ran from Cincinnati to Columbus, Toledo, and Detroit (300 miles). To lure back some of the long-distance passenger traffic that had deserted the line in the 1920's, Dr. Thomas Conway—C. & L. E.'s president—ordered radically new cars.

The 20 new cars—including Branford's 116—were built by the Cincinnati Car Company and delivered in 1930. They were lightweight cars, constructed partly of aluminum, and weighed only 24 tons—some 15 tons less than their predecessors. Acceleration was rapid, and the cars were run at 90 mile an hour speeds (one raced an airplane as a publicity stunt—and won). Several other interurban lines ordered somewhat similar cars. The "bullets" of the Red Arrow Lines' Philadelphia-to-Norristown third-rail division were built by Brill in 1931, and are the only lightweight, highspeed interurban cars running in America today.

The lightweight interurban cars' reign as speed king were regrettably short. The C. & L. E. cars finished out their working lives in Iowa and Pennsylvania, where a number of short lines survived into the 1950's. Branford's 116 came from the Cedar Rapids & Iowa City Railway.

Today (1965) interurban passenger service is gone. There remain only the tiniest freight-only remnants of the once great interurban network. The big, impressive cars dash through the countryside no more!

Opposite Page.

Top: Third Avenue line at 10th St., New York Elevated R. R. in 1882. *E. Watson Collection*

Bottom: Our oldest car, "G", is pictured here in New York. *E. Watson Collection*

RAPID TRANSIT CARS

Throughout the later 1800's, America's cities were growing in size—helped by the new horse-drawn streetcars. People were moving away from the city center to new residential districts and suburbs that a little earlier had been fields and farmland, just as is continuing to happen today. Downtown congestion was becoming intolerable in large cities like New York, especially as the city is located on narrow Manhattan Island, and travel from downtown to the new residential areas 5 miles north (above 42nd Street) was very time-consuming on the over-burdened horse-car lines.

Inventive men began to think of ways to carry people rapidly without having to compete with slow-moving street traffic. Although a pneumatic subway was experimented with in 1870, nothing further was done with underground transportation until the turn of the century.

In 1867, Charles T. Harvey built an elevated railway in Manhattan, running along Greenwich Street from the Battery to Cortlandt Street. It was supported on upright iron columns along the edge of the sidewalk. The half-mile line was cable-powered, but after its extension to 30th Street in 1870 steam locomotives were used to haul trains. As the system expanded, a more substantial "el" structure was developed, along with heavier passenger cars and more powerful engines. Branford's Manhattan elevated money car "G" was built as a passenger car back in 1878 by the Gilbert and Bush Car Manufacturing Company of Troy, N. Y. It is the oldest car at the museum, and the oldest rapid-transit car in existence anywhere. Note its board-and-batten siding and the narrow, pointed-top windows like those in early steam railway coaches. In 1893 it was converted to a money collection car and baggage doors were put in, carefully reproducing the style of the original windows. Now an electric trailer, car "G" served on the Third Avenue "el" until the latter's demolition in 1955.

Other early "el" cars at the museum are instruction car 824, originally a Manhattan passenger car built by the Pullman Palace Car Company in 1881; and 197, also Pullman-built for the Kings County Elevated Railway of Brooklyn in 1888. The latter was used as a passenger car until it was taken out of service in 1955.

In 1890, there were four elevated lines in Manhattan, and as many in Brooklyn, and elevated lines soon appeared in Chicago, Philadelphia and Boston; Liverpool, England; Berlin and Hamburg, Germany. Electrification was introduced in Chicago in 1895 with motor cars pulling trains of trailer cars. Frank Sprague then developed the multiple-unit control system, which made it possible to run any number of motored cars from the lead unit. This new system was first employed on the Chicago "el" in 1897. Elevated cars built originally for electric operation include 659, built 1901: 1227, built 1903; and 1349 and 1362, convertible cars built in 1905.

The new "rapid transit" eased the transportation problems for large masses of people, and permitted city expansion far beyond the center. The "els" caused property values to rise in the areas they served. They made possible the concentration of people in apartment houses in residential areas, and in large office buildings downtown.

It may come as a surprise to learn that subways are as old as elevated lines. The first was opened in London in the 1860's and used conventional steam-hauled trains of compartmented cars. London also opened the first electric subway—the City and South London line in 1890. America's first was in Boston (1897) under Tremont Street, served by trolley cars, as it still is today. Multiple-unit trolley trains were added in 1905. New York's first was the Interborough line from Broadway and 145th St. to City Hall, opened in 1904.

Although subways were very expensive to build, they eliminated the need for the rather unsightly overhead structure of the "els", and were thereby in large part freed from the existing street pattern.

The first subway cars in New York were of wooden construction, but for safety reasons all-steel cars were soon introduced. The first cars had doors at the ends only, but to speed loading, center doors were later added. Interborough Rapid Transit car 3662 is an early all-steel car (excepting the wooden window sash), built in 1907, as one of the first with center doors.

197 at Coney Island yard. *R. Presbrey Collection*

824 at Bronx Park Station.
E. Watson Collection

659. Note trolley poles, which were used when outer ends of el lines ran along the ground.
E. Watson

1227 in storage in Brooklyn.
E. Watson Collection

A convertible "el" car like 1349 and 1362, in summer operation. *J. Stern*

The Parlor Car

The pinnacle of trolley car "royalty" was the private parlor car. Out of some 100,000 electric railway cars, less than 100 were of this luxurious class, built for executives and their official guests, or for extra-fare deluxe charter service. Here was the electrified counterpart of the private Pullman car, or of today's private airplane or luxury yacht.

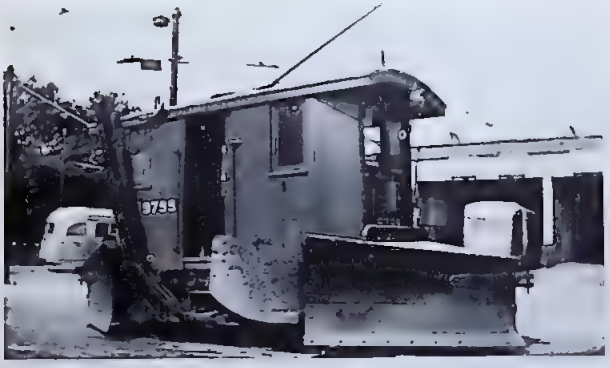
No. 500 is the Branford museum's most prized possession — the parlor car of the Connecticut Company. She is one of a very few survivors of an aristocratic breed, and boasts of hand carved and inlaid oak woodwork, bevel edge mirrors, intricate scrollwork, and plate glass windows. A broadloom carpet, wicker chairs, a small galley, a drinking fountain, and a lavatory with an art glass window — all combine to make 500 one of the most opulent vehicles to grace steel rails. Used by the Connecticut Company until the end of their rail service in 1948, she travelled all over the state, and even to New York and Boston.

On special occasions, this treasured car is run on the Branford line for the pleasure of members and visitors alike. Otherwise she reposes in her carbarn — proud, resplendent, and aloof — seemingly aware of her aristocratic superiority amongst her commonplace fellows.

500 — The aristocrat of electric railway cars. *H. Hamilton*

When 500 was new — a builder's photo showing open platform and platform grillwork.
E. Watson Collection

Luxurious interior of Parlor Car 500. *V. Uzoff*



Plow 9799 at 9th Ave. Depot.
E. Watson Collection

Below left: Snow sweeper posed at Farm River Road. *V. Uzoff*

Below right: Sweepers often were spectacular to see in operation. Here is 9832 performing its duties in Brooklyn. *R. Jackson*

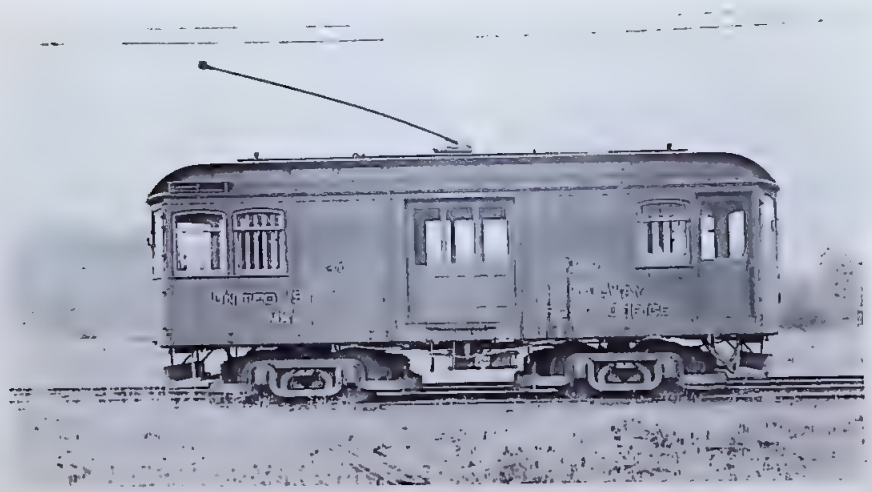
Below: 9800 clearing drifts from the museum's rails. *J. Stern*

SERVICE CARS

Seldom seen by the riding public, every large trolley company had a fleet of special equipment that performed duties essential to efficient operation. Perhaps most spectacular of these were the snow sweepers and plows that kept tracks open through winter blizzards. The sweepers' revolving brooms threw light snow aside in a picturesque arc, while heavier snows yielded to the plows' sturdy steel blades. Branford's two sweepers 59 and 9832 ran in Westchester County and Brooklyn, respectively. No. 59 was built in 1914 by the McGuire-Cummings Company, and is a stock model used in many American cities. J. G. Brill built 9832 in 1915; it is a much heavier vehicle, used in Brooklyn until the end of trolley operation in 1956. Brooklyn snow plows 9799 and 9800 were built in 1898 by the Taunton, Mass. Locomotive Works. The former is a "nose" or "wedge" plow that divided the snow on each side of it; the latter is a "shear" plow that moved the snow to the right and this design was more commonly used on double-tracked city streets. A quite different plow is rotary No. 5 of the Montreal Tramways, built in 1910. Its rotating blades were effective in clearing deep drifts along suburban routes. It is the last electric rotary plow left in North America.

Another important vehicle is the line car, used to construct and maintain the overhead wires from which street cars draw their current. No. 25 was built and used in Ottawa, Canada. Its tower can be raised to almost twice the height of the car, and the platform on top can be pivoted to provide a place for workmen to stand. Automotive line trucks, like ours from Wilmington, Delaware, were more commonly used on city streets for overhead maintenance, as they did not interfere with the operation of the regular trolleys.

An interesting comparison of the equipment of two eras. Line car 25 and the more mobile line truck in use on trolley wire repairs. *J. Stern*



The mail car on the Short Beach meadow line. *K. Cochrane*

An unusual example of special service cars is No. 302, a U.S. mail car of the Union Street Railway of New Bedford, Massachusetts. It was built in 1907, and ran daily from the railway station at Fall River to the New Bedford post office, and thence to Wareham, stopping at all intermediate post offices to pick up and deliver mail.

No. 999 was built in 1905 in the shops of the Brooklyn Heights Railroad as an elevated parlor car, but it looks more like a conventional interurban than a rapid transit car. It was later equipped with demonstration control and braking systems for the instruction of motormen, but unfortunately this equipment was removed before 999 was sold to the museum. After electrification of the Manhattan "els" IRT 824, an early elevated car, was supplied with similar demonstration equipment, which is still in place.

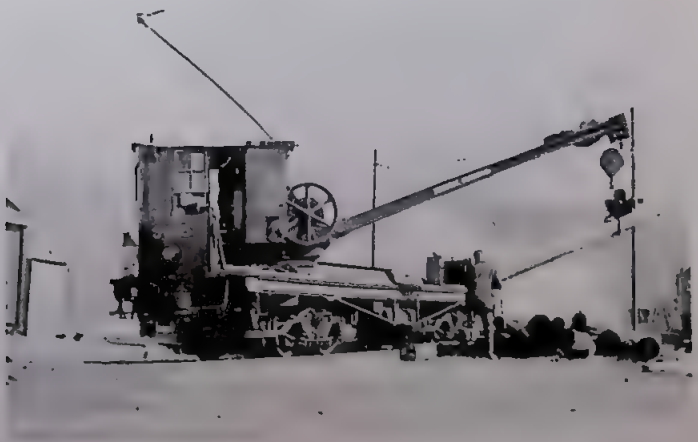
999 was originally an "el" instruction car. *H. Fagerberg*

The crane car W3 while in Montreal. *F. Bennett*

Crane cars were necessary not only to trolley operations for lifting rails and other heavy material, but they are equally essential to the Branford Trolley Museum for many tasks, such as rail transport, pole-setting, motor moving, and a-hundred-and-one other lifting jobs. No. 3715, with an Industrial Brownhoist crane of 5 tons lifting capacity, was built and used in Baltimore, Maryland. W-3 came from Montreal, and is a more sophisticated machine than 3715. It has a separate control for each operation, such as swinging, raising or extending the boom; and raising or lowering the "hook". Also several operations can be made simultaneously, with much time saving. The Differential Steel Car Company built W-3 in 1929.

Resembling a baggage car, 1504 is a representative emergency car. It was built in 1904 by the Rhode Island Company and carried a variety of tools and special equipment to cope with derailments, collisions, and a host of other difficulties involving disabled cars and obstructed track. It was stationed in downtown Providence during every evening rush hour, ready to answer calls.

3715 sorting poles at the Museum.



Left: 1504 in Providence. *F. Dodge Collection*

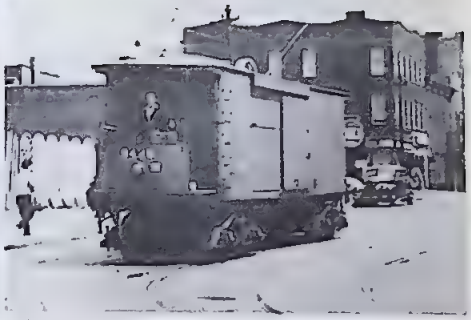
Right: "Amy", our ever-useful work horse. *J. Stern*

"Amy" is an electric locomotive built by the General Electric Company in 1902 for the Abendroth Foundry at Port Chester, New York, where it switched freight cars for 30 years. For the next quarter century it rested, abandoned, in a yard. In 1957 a member discovered it and persuaded the owner of the property (now a boat building shop) to donate the locomotive to Branford. We named it "Amy" after the donor's granddaughter. Amy looks diminutive, but weighs 24 tons! 5002 is a more conventional "steeple cab" locomotive — a design used by many trolley and interurban lines for freight service and switching duties. Also a kind of locomotive is the shop switcher — also from Montreal — used to shunt trolley cars' trucks around the mechanical shop. It was improvised from a streetcar truck with a deck laid on top, and a wooden pedestal for the trolley-pole base.

Left: A sister gas car in rail testing service.

Below: Locomotive 5002 in Montreal. *J. Stern*

9137 on Church Ave., Brooklyn.



9425 at 9th Ave., Brooklyn.

E. Watson Collection

Numbers 9421 and 9425 are self-propelled trolley freight cars of the South Brooklyn Railway, for whom they were built in 1903 by the Middletown, Pennsylvania, Car Company.

Numbers 9137 and 9161 also came from the South Brooklyn Railway. They are a rail carrier with an electrically operated pillar crane, and a gondola car, respectively. Both are self-propelled, and were built in 1903.

No. 62 is called a "drill motor" (built 1906) which hauled motorless or disabled Interborough Rapid Transit cars to the repair shops.

M-1 and M-8 are trailer flat cars, built for the New York Elevated Railway by the Wason Car Company in 1878. They were used in the construction of the original Interborough Subway, and have old style wooden-centered wheels.

Cabooses 12, 14, and 516 are used for the overnight accommodation of members of the museum association. The four and eight-wheeled box and flat cars came from the Singer Sewing Machine factory at Elizabeth, New Jersey, where they served as transport within the plant. The cars were built at the turn of the century, and are similar to steam railroad freight cars of that period. They are used here for spare parts storage. Gas car 120 is a recent accession, a former Sperry rail testing car, and later an ammunition carrier for Remington Arms at Bridgeport.

Right: 9161 in Bush Terminal Yard.
E. Watson Collection

Below: IRT 62 resting in Manhattan. *G. Votava*

ROSTER OF EQUIPMENT

PASSENGER STREETCARS

*Numbers**	*Former Owners*	*Builder*	*Date*	*Car Type †*
3	Metropolitan St. Ry.	Stephenson	1893	4-wheel closed horsecar
9	Montreal & Southern Counties Ry.	Grand Trunk Ry.	1911	dt interurban
11 (100)	Toronto Trans. Comm.	Toronto Trans. Comm.	1933	4-wheel open horsecar
34	Lynchburg Ry., Five-Mile Beach Elec. Ry.	Jackson & Sharp	1899	st 9-bench open
61 (1567)	Rhode Island Co., United Elec. Rys.	J. M. Jones	1893	st deck-roof closed car
71	Goteborg Sparvagar	A.S.E.A.	1912	st deck-roof steel
116	Cincinnati & L. Erie, Cedar Rap. & Iowa Cy.	Cincinnati	1930	dt lightweight interurban
220 (33, 275, 20, 2780)	Third Ave. Ry. Metropolitan St. Ry.	Laclede	1892	st closed, ex-cable
250	Fairmount & Clarksburg, Monon. W. Penn Pub. Ser. City Lines of W. Va.	Jewett	1904	dt interurban
316 (1, 489)	Union Ry, Third Ave. Ry.	American	1895	dt closed deck-roof wood
356	Johnstown Trac. Co.	St. Louis	1926	dt lightweight
357	Johnstown Trac. Co.	St. Louis	1926	dt lightweight
500	Conn. Ry. & Lighting, Conn. Co.	J. G. Brill	1904	dt parlor car
614 (302)	Consolidated, Winchester Av., Conn. Co.	J. G. Brill	1901	dt 15-bench open
650 (884)	Wash. Ry. & Elec., Capital Transit	J. G. Brill	1912	ctr-entr. semi-convert.
709	Chicago, North Shore & Milwaukee Ry.	Cincinnati	1924	dt heavy interurban
775 (193)	Consolidated, Conn. Co.	Jewett	1904	dt r.r.-roof wood
830	Third Ave. Ry.	J. G. Brill	1908	dt deck-roof wood
850	New Orleans Pub. Ser.	Perley A. Thomas	1922	dt arch-roof steel
865 (512)	Consolidated, Conn. Co.	Wason	1905	dt r.r.-roof wood
884	Third Ave. Ry.	J. G. Brill	1909	dt wood convertible
923 (401)	Consolidated, Conn. Co.	J. M. Jones	1906	dt 15-bench open
948	Georgia Power Co.	Cincinnati	1926	dt deck-roof
1001	BMT, N.Y. City	St. Louis	1936	single-end PCC
1199 (283)	Conn. Co.	Stephenson	1906	dt r.r.-roof wood
1339 (563)	Conn. Co.	Osgood Bradley	1910	dt r.r.-roof wood
1403	Montreal Tramways, Montreal Trans. Comm.	Ottawa	1914	dt arch-roof
1414 (448)	Conn. Co.	Osgood Bradley	1911	dt 15-bench open
1425 (459)	Conn. Co.	Osgood Bradley	1911	dt 15-bench open

*former numbers shown in parentheses

† dt = double truck, st = single truck

PASSENGER STREETCARS (Continued)

*Numbers**	*Former Owners*	*Builder*	*Date*	*Car Type †*
1602 (612)	Conn. Co.	Wason	1911	dt deck-roof wood
1706 (W24)	Toronto Ry., Toronto Trans. Comm.	Toronto Ry.	1913	st single-end convertible
1792 (9730)	Nassau Elec. R.R., BMT, N.Y. City	Laclede	1899	dt deck-roof wood
1911	Conn. Co.	J.G. Brill	1919	dt arch-roof suburban
1972	Montreal Tramways, Montreal Trans. Comm.	Can. Car & Foundry	1929	dt single-end steel
2001	Montreal Tramways, Montreal Trans. Comm.	Can. Car & Foundry	1929	dt double-end steel
2350	Conn. Co.	Osgood Bradley	1922	st Birney safety car
2431	Pub. Serv. of N.J.	Cincinnati	1913	dt single end
2898	Toronto Trans. Comm.	Ottawa	1923	dt single-end Peter Witt
3000	Conn. Co.	Wason	1921	st Birney safety car
4573	Bklyn. Rapid Transit, BMT, N.Y. City	Laconia	1906	dt deck-roof convertible
5706	Boston Elevated, Metro. Transit Auth.	J.G. Brill	1924	dt arch-roof steel
8111	BMT, N.Y. City	St. Louis	1923	dt arch-roof Peter Witt

RAPID TRANSIT CARS

G (41)	N.Y. Elevated RR, Interboro, N.Y. City	Gilbert & Bush	1878	money collection car
M-1	N.Y. Elevated R.R. Interboro, N.Y. City	Wason	1878	dt flat
M-8	N.Y. Elevated R.R. Interboro, N.Y. City	Wason	1878	dt flat
62	Interboro, N.Y. City	Pressed Steel	1906	switching motor
197 (167, 324)	Bklyn. Rapid Transit, BMT, N.Y. City	Pullman	1888	elevated psgr trailer
659 (476)	Bklyn. Rapid Transit, BMT, N.Y. City	Jewett	1901	elevated psgr motor
824	Manhattan Ry., Interboro, N.Y. City	Pullman	1881	elevated instruction car
999	Bklyn. Rapid Transit, BMT, N.Y. City	Bklyn. Heights R.R.	1905	elevated instruction car
1227	Bklyn. Rapid Transit, BMT, N.Y. City	Osgood Bradley	1903	elevated psgr car
1349	Bklyn. Rapid Transit, BMT, N.Y. City	Cincinnati	1905	elevated convertible passenger car
1362	Bklyn. Rapid Transit, BMT, N.Y. City	Jewett	1905	elevated convertible passenger car
3662	Interboro, N.Y. City	Amer. Car & Foundry	1907	subway passenger car

*former numbers shown in parentheses

† dt = double truck, st = single truck

SERVICE CARS

*Numbers**	*Former Owners*	*Builder*	*Date*	*Car Type †*
Amy	Abendroth Foundry	General Electric	1902	4-wheel locomotive
shunter	Montreal Tramways, Montreal Trans. Comm.	Montreal Tramways	1920	4-wheel shunter (switcher)
W-3	Montreal Tramways, Montreal Trans. Comm.	Differential Steel	1929	dt crane
5	Montreal Tramways, Montreal Trans. Comm.	Peckham	1910	dt rotary snow plow
12	Long Island R.R.	Amer. Car & Foundry	1927	dt caboose
14	Long Island R.R.	Amer. Car & Foundry	1927	dt caboose
25	Ottawa Elec. Ry., Ottawa Transit Comm.	Ottawa	1923	st line maintenance
59	Yonkers RR, 3rd Ave. Ry.	McGuire-Cummings	1914	st snow sweeper
120	Sperry Rail Service, Remington Arms	J.G. Brill	1920's	dt gasoline-propelled
0245	Conn. Co.	Russell	1916	dt work car
302	Union Street Ry.	J.M. Jones	1907	dt mail
516	Lehigh & New Eng. RR	Amer. Car & Foundry	1914	st caboose
1504	Rhode Island Co., United Electric Rys.	Rhode Island Co.	1904	dt emergency
1575	Rhode Island Co., United Electric Rys.	Rhode Island Co.	1912	dt work car
3715 (6028)	United Ry. & Elec., Baltimore Transit Co.	United Ry. & Elec.	1913	dt crane
5002	Montreal Tramways, Montreal Trans. Comm.	Montreal Tramways	1918	dt locomotive
9137 (96)	South Brooklyn Ry., N.Y. City	Middletown	1903	dt rail carrier
9161 (184)	South Brooklyn Ry., N.Y. City	Baltimore Steel	1904	dt gondola
9421 (171)	South Brooklyn Ry., N.Y. City	Middletown	1903	dt box freight
9425 (175)	South Brooklyn Ry., N.Y. City	Middletown	1903	dt box freight
9799 (9, 340, 68)	Nassau Elec. R.R., BMT, N.Y. City	Taunton	1898	st wedge plow
9800 (10, 341, 69)	Nassau Elec. R.R., BMT, N.Y. City	Taunton	1898	st shear plow
9832 (7)	Brooklyn City R.R., BMT, N.Y. City	J.G. Brill	1915	st snow sweeper

*former numbers shown in parentheses

† dt = double truck, st = single truck

CAR ACQUISITION

The Branford Collection described in detail in another portion of this book is as complete as availability of car types would permit. When the Museum was incorporated in 1945 there were operating systems relatively close by. The New Haven division of the once statewide Connecticut Company was the source of many of the original cars to come to the property. These were the easy ones, as they were run from the local car barns over former operating lines under their own power before the discontinuance of trolley service to East Haven in 1947. A few cars from New York, which had been brought to New Haven earlier by railroad car, also joined the caravan for their last trip through the city's streets. From here on, acquisitions would be more difficult, with some transported from quite distant spots, but we are an earnest, dedicated and ingenious group; the cars are here.

The assemblage of varied car body types and paint color schemes might indicate the collected cars to be chance survivors of the trolley era. However, this is not so. Even the Connecticut cars which were so temptingly at hand were carefully selected to be representative of every significant remaining type, and even some of these could not be acquired because of fund limitations. Merely to obtain a single specimen of each type of electric railway car requires a large collection. We have included the beloved opens, four-wheeled and bouncy as well as the more sedate double trucker; closed passenger cars, from four-wheelers to heavy interurbans and the rapid transit cars; the lightweights; and, of course, our prized parlor car. Less glamorous are our work equipment, plows, sweepers and unique mail car. From horsecar to streamliner, each one is here.

By the time the Museum was founded, many varieties had almost vanished. The search to find any specimens of some of these rarities occasioned great difficulties, disappointments, and expense. It is the pride of Branford that the apparently unattainable has been attained; often the obscure recesses of forgotten carbarns have yielded relics miraculously preserved from the scrapper's torch, the weather, and decay.

Right: Almost every "new" car to arrive at the museum property is unloaded via a carefully constructed ramp. *J. Kelly*

Below: Loading line car 25 by crane in Canada. *J. Stern*

Left: Ready to leave its home for the museum. *L. Bass*

Below: Nearing the end of a long journey from Iowa. *R. Presbrey*

A few cars have been donated; the great majority, their market value reduced by time and obsolescence to the value of their metal content alone, were obtainable at scrap prices.

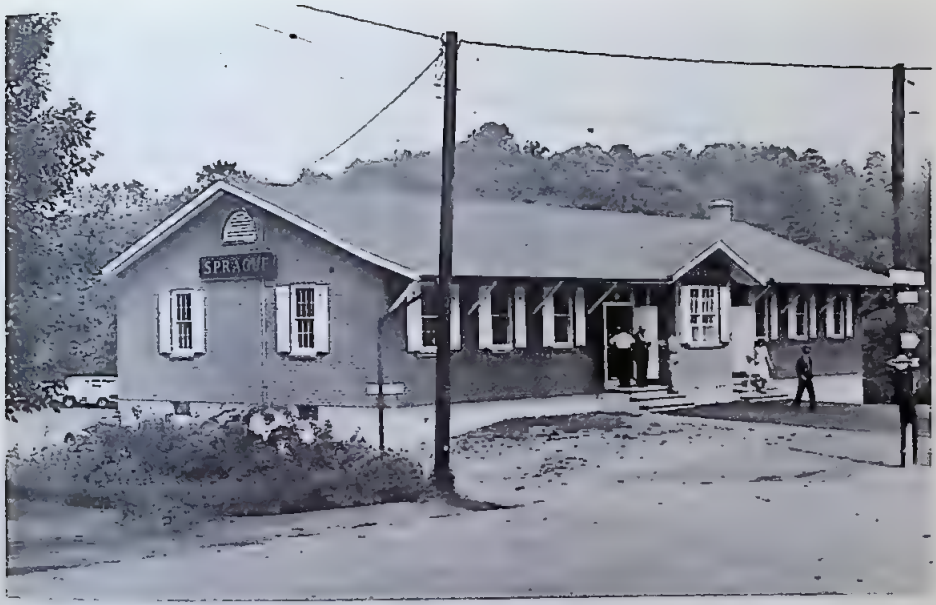
Geographically, many trolley systems are represented from points as widely scattered as New England, Iowa and Georgia. Fifteen States, the District of Columbia, two Candian Provinces and one foreign country, Sweden, are represented in our collection.

How does one ship a trolley? Surely the average visitor would find such an assignment too formidable even to consider and to Branford it has often been a troublesome problem. The normal procedure has been to employ either low-bed trailer truck or railroad flat car. Temporary rails must first be laid in proper gauge on the trailer or flat car, and secured against lateral movement. Then the car on its trucks is carefully moved onto the rail; with exceptionally long or high cars, trucks and body must be loaded separately. Finally the whole assemblage is secured against shifting using cables and stays. Only then can the journey to Branford begin.

The slow speed imposed by such heavy and large-size lading makes a journey of only a hundred miles by truck and trailer an all-day affair. Although a railroad flat car moves at higher speeds, the journey to the Museum is complicated by the necessity of transshipping the trolley from the nearest railroad siding to our own East Haven railhead, a distance of only half a mile, but requiring many additional hours of labor and the services of a low-bed trailer and truck, and frequently a crane, but always many working members.

By either method the expenses are high — ranging from about three hundred dollars for a short haul of a hundred miles, to twelve hundred dollars and more for a journey of a thousand miles.

As a variation on the above, a very few cars have travelled on their own wheels in freight trains as far as the East Haven railroad yard. There they too had to surrender to the final indignity of rubber-tired transport for their last half mile of travel before reaching sanctuary at the Museum's own railhead in front of the Sprague building.



BUILDINGS & FACILITIES

THE SPRAGUE BUILDING

A little more than a quarter of a century after his death, the pioneering work of Frank Julian Sprague in the electric transit industry was commemorated by a substantial gift to the museum. In 1957, Mr. E. J. Quinby, then president of the Branford Electric Railway Association, approached Mrs. Sprague regarding an appropriate memorial to her husband. Mr. Quinby suggested a spacious building designed to house books and memorabilia associated with electric railways, and which would provide needed facilities for the Museum's ever-increasing number of visitors.

Although advanced in years, Mrs. Sprague became thoroughly interested in this project. She and her sons discussed the plans in detail with our members, and generously agreed to donate the cost of the structure. Construction began in December of 1959 and the building was dedicated on Sunday, August 21, 1960. Robert Sprague, one of her sons, gave the principal speech at the dedication. Unfortunately Mrs. Sprague was unable to attend because an injury confined her to her house at the time.

The Sprague Building has several interesting features. It is a brick-faced concrete block structure, 35 by 80 feet, resembling a traditional railroad station with a typical telegraph bay. Visitors enter a spacious waiting room complete with ticket office where models and pictures are on display. The Sprague Room occupies one end of the building. In this large room are displayed pictures and smaller exhibits relating to the history of electric railways, with particular reference to the part played by Frank Julian Sprague. Donations or the loan of materials suitable for display are solicited from visitors and collectors as well as from Association members. The other end of the building contains washrooms, a members' locker room, and a growing reference library of electric railway material. The Sprague Building stands as a substantial memorial to the man who is justly called "The Father of Electric Traction".

THE TROLLEY LINE

Within a mile and a half the line traverses a surprising variety of terrain. Beginning in a suburban street at the Sprague Building, the line crosses the East Haven River on our highest and longest trestle. It then proceeds thru on to the main Museum or car barn area, where the trolleys and rapid transit cars are stored. Leaving this area, the track passes Narragansett Siding and the stopping place at the picnic grove entrance, then proceeds thru woods, meadowland, around curves and over a hill, thru a rock cut and past a quarry. At this latter point the car crosses over a culvert, through which once ran a cable railway that carried rock from the quarry to the stone crusher and loading dock on the then-navigable East Haven River. The track emerges from the woods and approaches a second and completely rebuilt wood pile trestle across Stony Creek, where the line temporarily terminated after the original trestle was severely damaged by two hurricanes during the 1950's. As funds are available, the trackwork, pole line and overhead wire will be rebuilt and trolleys will again traverse the four-tenths of a mile of salt marsh leading to Short Beach.

The entire line was originally double tracked, but it could not be effectively maintained in safe condition, and, reluctantly, the second track was torn up and the materials sold for scrap to raise funds in the early days of the Association's existence.

THE POWER PLANT

Direct current for the trolleys at Branford is produced in the substation attached to the Sprague Building. Commercial power at 2130 volts A.C. runs a motor to which is connected a generator mounted on the same revolving shaft, which in turn produces 550 volts D.C. This 400 kilowatt motor-generator unit was half a century old when obtained from the Ottawa, Canada Hydro-Electric Commission in 1960. A smaller, 100 kilowatt motor-generator in the substation is capable of powering a single car. Future plans call for eventual installation of a rectifier power system.

Left: Installing the small motor-generator unit required considerable patience and skill. *J. Stern*

Below: The Ottawa motor-generator arrives at the Museum. Unloading trolley cars is actually less difficult since they weigh no more and have wheels besides. *R. Thain*

A busy day at Branford, with many visitors enjoying an old-fashioned trolley ride.

THE MUSEUM AREA

Here are the stars of the entire museum presentation. Except for the quonset barn, all of the structures have been erected by the members since 1953. They house a varying number of cars, generally six or more. They are separated by fire lanes to gain some protection for them. The barns are constructed of upright telephone poles set in the ground, supporting trussed wood roof and wall framing. The exterior covering is of corrugated aluminum sheet. One barn is the shop where one car at a time can be overhauled or receive major repairs.

Cars are also worked on and restored in their barns because the shop could not be assigned to more than one car at a time for the long period required for restoration.

As many as possible of the barns and cars are open for your inspection. However, with major work sometimes under way, we cannot provide safe access to all the cars described in the Guide Book. But you can sometimes find a member who is taking a break from a task or who is acting as a "people-greeter" who will assist you in finding a favorite or a hometown car.

At the car stop on the main line is our Souvenir Stand and a Waiting Station. The Stand is usually open when visitors are to be expected. Here may be purchased publications of interest to the casual tourist, the rail enthusiast or the trolley fan. These souvenirs and books are provided for your convenience and your patronage is invited.

THE PICNIC GROVE

In the heyday of the trolley, the operating companies developed amusement parks and beach areas to attract riders to use the cars for pleasure purposes in the evenings and on Sundays, thus producing more revenue thru greater utilization of equipment. As a token development of this nature, we have our wooded picnic grove with tables and benches for visitors. It is a pleasant spot in which to rest and take refreshment "between the cars".

ACTIVITIES & MEMBERSHIP

Looking about the Museum's car barn area, you will wonder how the cars and the line they run on are cared for, and what will happen to cars in storage. Obviously, a lot of work is involved. The problems of maintenance at the Museum are many and difficult, although they are basically the need for funds and manpower, plus time.

Cars must be acquired when the transit companies no longer want them; otherwise, they are scrapped and lost to any collection. This timing unfortunately is not within our control. We have thus lost car types which would make our collection more complete, and have been forced to rescue cars and bring them to the property in disproportion to our current ability to house and maintain them. We thus regretfully explain why we present a less than ideal appearance in some areas. However, we encourage those with a skill or the will to assist us in the work of preservation. All of the work is done on a volunteer basis by members of the Branford Electric Railway Association. Most members can work at the museum only on weekends. This time limitation and frequent adverse weather or temperature conditions often prevent projects from reaching early completion. Even some of our most important projects must yield to the priority requirement of operation for visitors. The operating trolley line is the base upon which the museum is built. Without the financial support that is obtained from running vintage equipment and the welcome donations from visitors, the historic purpose of collecting old street cars would not be possible.

After trolley operation, the most important activity is rehabilitation of our rolling stock. The cars on which our visitors ride must be kept physically and mechanically sound. Other cars are being restored as the availability of skilled volunteer labor permits. It is almost miraculous that some early types have survived at all, considering their early obsolescence, accidents, car barn fires, and wear and tear of the years. Time and the elements also take their toll, particularly in the years of storage outdoors before barns can be financed and built. However, most cars do have basically sound structural frames and can be successfully rebuilt.

The restoration of an elderly car — whether street railway, interurban, or rapid transit — involves several skills and often years of spare-time work. True restoration requires the removal of "improvements" and changes made during a car's operating years. To do this correctly, much careful research must be done in old publications such as trade journals or newspaper accounts of the day. This is particularly true for the oldest cars, which were much altered for their later day service as work equipment. Builder's data and photographs are more readily available for cars built after 1900. With the research accomplished, work can commence. Old paint has to be removed and deteriorated wood and steel parts repaired or replaced, often with custom made pieces. Mechanical and electrical systems require careful overhaul so that the vehicle can be run safely. Car roofs are weather proofed with tightly stretched, painted canvas. Years of exposure to sun and weather deteriorate the canvas which must be removed and replaced. Every piece removed must be photographed or a measured drawing made to ensure accurate reconstruction. There are literally hundreds of pieces to record, let alone restore, refinish and reinstall. When all these operations are completed many man-hours later, then a car can be painted, striped and lettered to become an exhibit for which the museum and visitors alike can feel pride.

Opposite page:
Top: Rebuilding Riverside Curve and car restoration require quite different skills. Center: Sandblasting a metal car side before painting and a barn being extended; both protect the cars. Bottom: Trestle rebuilding and track switch installation shown under way.

Photos by: V. Uzoff, J. Stern, A. Lonto, F. Pfubler

The track and overhead wire system were usable but old when we acquired them in 1947. However, they had had only minimum maintenance and no replacement for years. While we had an operating trolley line, we also had much to do to keep it operable. Maintenance of track and of overhead power supply wires has been the responsibility of the few members having the specialized knowledge for this work. Track repair requires much hard physical labor and constant vigilance to guard against defects that would endanger the safety of visitors. A 30-foot length of rail weighs about a half ton and the efforts of many people are needed to move one length. The rail is supported on more than 4000 ties. Half of these have been renewed since the property was acquired. Each new tie demands 2 man-hours to install, plus additional labor for aligning, spiking the rail, tamping, and ballasting. Overhead wire work has required the replacement of many worn fittings and rusted span wires. More than half of the poles that support the wire have had to be replaced, and new overhead has been constructed over sidings and in car barns.

Besides the fundamentals of car repair and track and overhead maintenance, completely routine but nonetheless important and essential jobs have to be done. These include general work such as keeping buildings painted and clean; cutting grass; attending to correspondence; preparing publicity and publishing the newsletter; keeping financial and visitor records; arranging rail-fan trips to produce added income; and last but not least, trying to keep the grounds free of refuse.

The foregoing indicates what is involved in the operation of the museum and if anything, the statement is oversimplified. Practically everything you see here is the result of many hours of volunteer effort over the years, mostly by men of average ability who are directed by our common interest and goal. But labor alone is not sufficient. Materials and supplies must be purchased. Operating costs are high; and improvements require heavy expenditures.

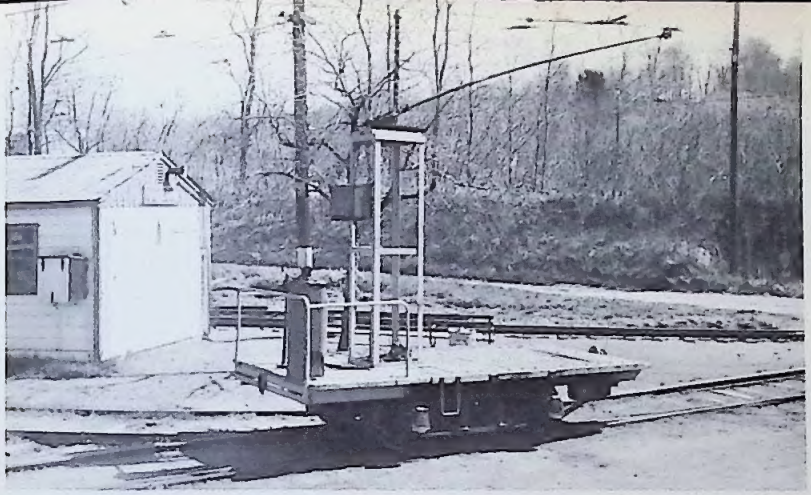
How have a small group of volunteers accomplished all this? The answer is — with your help! We must rely upon you, the visitor — for whom the museum exists — for the greater part of its support. The "fares" on the car, this guidebook, the publications and souvenirs, membership dues, and especially contributions, are our sources of income.

If you have enjoyed your "Ride Down Memory Lane", we would like to ask for your interest and support to assist the museum's growth. But for people like yourself all of this would not exist, and with your help many more will be able to share your enjoyment on a visit to the museum, where a ride on an old-fashioned trolley car will remain a cherished memory. We hope that our trolleys will be running for the benefit of generations to come, to interpret for them a colorful episode of America's past. Your contributions will in no small measure assure this.

The United States Treasury Department recognizes the Branford Electric Railway Association as a non-profit educational institution under the Internal Revenue Code. Therefore, any contributions of money, materials, property, or bequests by will, are fully tax deductible.

Would you like to join with us at the museum and have the satisfaction of directly or indirectly participating in the museum's efforts? It's easy to join, rewarding and inexpensive! You will receive the bi-monthly Journal (newsletter), receive a membership card, which is your pass to ride the cars, and enjoy other benefits. If you cannot participate actively, your dues will aid the museum and bring you the satisfaction of helping. There are several classes of memberships available to those interested, starting for as little as $3.00 a year. We'll be delighted to send you an application blank. Write to:

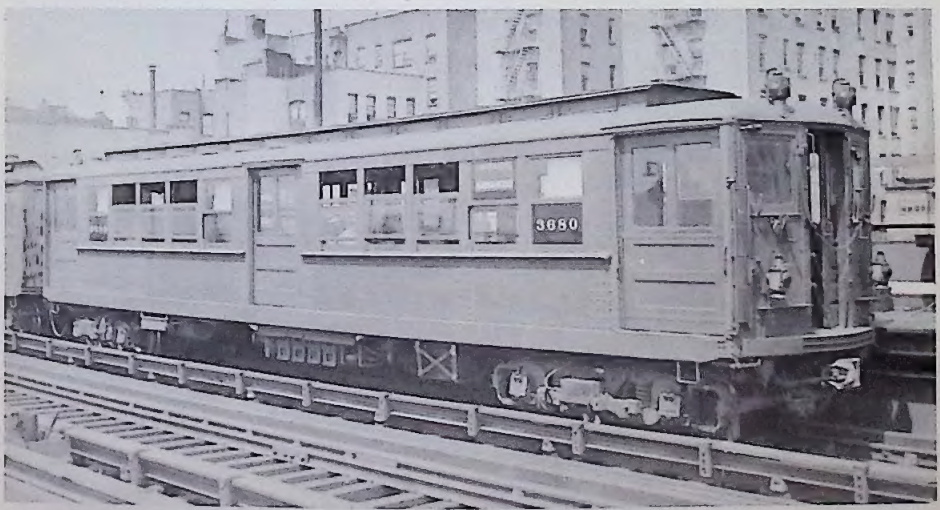
Branford Electric Railway Ass'n.
P.O. Box 457
Short Beach, Connecticut 06407



Above: Johnstown (Pa.) home made work car, affectionately dubbed "the flying brick" which well describes its springless ride. *R. Fletcher*

Directly Below: A sister of 3662 on the I.R.T. Broadway — 7th Avenue line, taken at 225th Street Station in 1936. *E. Watson Collection*

Bottom: 1575 at Cranston, R. I. Repair Shop yard, about 1933. *J. Winslow Collection*



ADDITION TO ROSTER OF EQUIPMENT (pages 48 and 50)

*Numbers**	*Former Owners*	*Builder*	*Date*	*Car Type †*
629 (4239)	Third Ave. Ry. Wiener Stadtwerke Verkehrsbetriebe (Vienna City Transit System)	Third Ave. Ry.	1939	dt lightweight
None	Johnstown Trac. Co.	Johnstown Trac. Co.	1945	st flat

In addition to the listing on the opposite page, the Museum gratefully acknowledges the recent donations and assistance of the following:

Allied Chemical Co.
American Export Isbrandtsen Lines
A. B. Chance Co., Centralia, Mo.
The Bilco Co., West Haven, Conn.
Dolan Steel Co., Inc., Bridgeport, Conn.
M. B. Foster Elec. Co., New Haven, Conn.
General American Transportation Corp.
Johnstown (Pa.) Traction Co.
H. E. Littlewood, E. E., Irwin, Pa.
McCulloch Corp., Los Angeles, Calif.
W. J. Megin, Inc., Naugatuck, Conn.
Oesterreichische Bundesbahnen (Austrian Federal Railways)
Wiener Stadtwerke Verkehrsbetriebe (Vienna City Transit System)

The volunteer work of the members is the backbone of the Museum's strength and the assurance of its continued growth.

Left: Construction of Barn 5. The cars which will be housed serve as the staging and work platforms while the roof is being framed. *J. Stern*

Right: Making the final adjustment on a section of new overhead wire construction over new track on the Short Beach meadows. The ex-Sperry gas car here serves as a line car. *R. Fletcher*

Representatives of earliest and latest models of electric car. *J. Stern*

The museum wishes to express its gratitude to the following corporations, whose generous donations of materials have been of great assistance and encouragement.

American Locomotive Co.
Baltimore Transit Co.
Boston & Maine R.R.
Canadian National Railways
Capital Transit Co. (Washington)
Cedar Rapids & Iowa City Ry.
Chesflex (New York City)
City Lines of West Virginia
Coffing Hoist Co. (Charlotte, N. C.)
The Connecticut Co. (New Haven)
Esso Standard Oil Co. (N. Y. City)
Five-Mile Beach Elec. Ry. Co. (N. J.)
Franklin Institute (Philadelphia)
Geigy Chemical Corp. (Ardsley, N. Y.)
General Electric Co.
W. W. Grainger Co. (N. Y. City)
Harrisburg Railways Co. (Pa.)
Hubbard & Co. (Pittsburgh)
Jamaica Buses (Jamaica, N. Y.)
Jenkins Bros. (N. Y. City)
Johns-Manville Corp. (N. Y. City)
The Kerite Co. (Seymour, Conn.)
The Leach Co. (Oshkosh, Wisc.)
Linde Co. (New York City)
Long Island Rail Road
Morganite, Inc. (New York City)
Nalco Chemical Co. (N. Y. City)
Narragansett Brewing Co. (R. I.)
New Haven Trap Rock Co.
New Orleans Public Service
New York City Transit Authority
New York, New Haven & Hartford R.R.
Niagara Frontier Transit System (Buffalo)
Pacific Coast Borax Co. (Los Angeles)
Pennsylvania State College
Philadelphia Transportation Co.
Poughkeepsie & Wappingers Falls St. Ry.
Charles Read & Co. (Jersey City)
Reading Bus Co. (Reading, Pa.)
Scheu Products (Upland, Calif.)
Simplex Wire & Cable Co. (Cambridge)
Stanley Chemical Co. (E. Berlin, Conn.)
Tecsolv (Northvale, N. J.)
Templeton, Kenly & Co. (Broadview, Ill.)
The Texas Co. (N. Y. City)
Third Avenue Transit Corp. (N. Y. City)
Toronto Transit Commission
Union Street Ry. (New Bedford, Mass.)
United Transit Co. (Providence)
University Loudspeakers
Western Union (N. Y. City)
Wilkes-Barre Transit Co. (Pa.)
Woodings-Verona Tool Works (Verona, Pa.)
Yale & Towne Mfg. Co. (New York City)

Cover photo credits: 1425 Connecticut open car and 2350 Connecticut safety car by J. Stern. 4239 Vienna (629 Third Avenue Railway System) by R. Jackson.

2350 CONNECTICUT
MIDDLETOWN

4239